CCD-F401/F402

RMT-502

SERVICE MANUAL

US Model
CCD-F401/F402
Canadian Model
CCD-F401

This photo is CCD-F401.

Remote commander is available as a unit, but as individual parts the battery case lid of commander is only available.

Handycam
Video 8

For MECHANICAL ADJUSTMENTS, refer to the "8mm Video MECHANICAL ADJUSTMENT MANUAL III (U MECHANISM)" (9-972-732-11)

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 1.43 cm ($^{1}/_{16}$ inch)/sec. LP mode: Approx. 0.72 cm ($^{1}/_{32}$ inch)/sec. (playback only)
Recording time	SP mode: 2 hours (P6-120)
Playback time	SP mode: 2 hours (P6-120) LP mode: 4 hours (P6-120)
Fast forward/rewind time	Approx. 6 min. 30 sec. (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 x power zoom lens f=8.5 to 68 mm ($^{11}/_{32}$ to $2^{3}/_{4}$ inches) F 1.6 with macro Filter diameter: 46 mm ($1^{13}/_{16}$ inches)
Auto focus system	TTL
Color temperature	AUTO, HOLD ☼ (indoor) 3,200 K ☀ (outdoor) 5,800 K
Minimum illumination	2 lux
Illumination range	2 lux to 100,000 lux (0.2 to 9294 footcandles)
Recommended illumination	More than 100 lux (9 footcandles)
Aperture correction	Automatic With backlight adjustment

— continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

Input and output connector

Video input/output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output	Phono jack Input: -7.5 dBs, input impedance more than 47 kilohms Output: -7.5 dBs, (at output impedance 47 kilohms) impedance less than 1 kilohms
RFU DC OUT	Special minijack, 5V DC
Earphone jack	Minijack, 8-ohm impedance
Remote Ⓛ jack	Stereo mini-minijack
MIC jack	Minijack, -66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	6.2 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	-20°C to +60°C (-4°F to +140°F)
Dimensions	Approx. 111 × 139 × 330 mm (w/h/d) ($4^{3}/_{8}$ × $5^{1}/_{2}$ × 13 in.)
Weight	Approx. 1.2 kg (2 lb 10 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, monaural type

Wireless Remote Commander

Remote control system	Infrared control
Command mode	VTR 2
Power requirements	3 V DC, 2 size AA (R6) batteries
Dimensions	Approx. 57 × 20 × 120 mm (w/h/d) ($2^{1}/_{4}$ × $^{13}/_{16}$ × $4^{3}/_{4}$ inches)
Weight	Approx. 62 g (2 oz) (excluding batteries)

Supplied Accessories

Refer to Page 6.

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

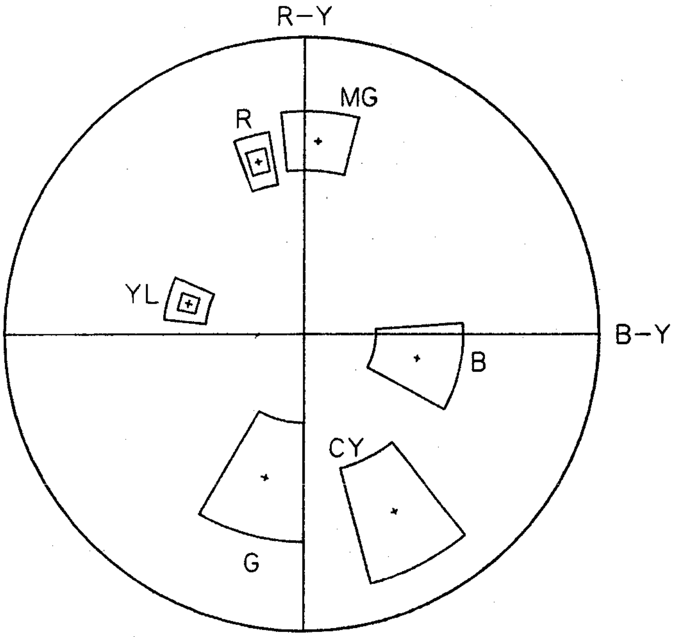
1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

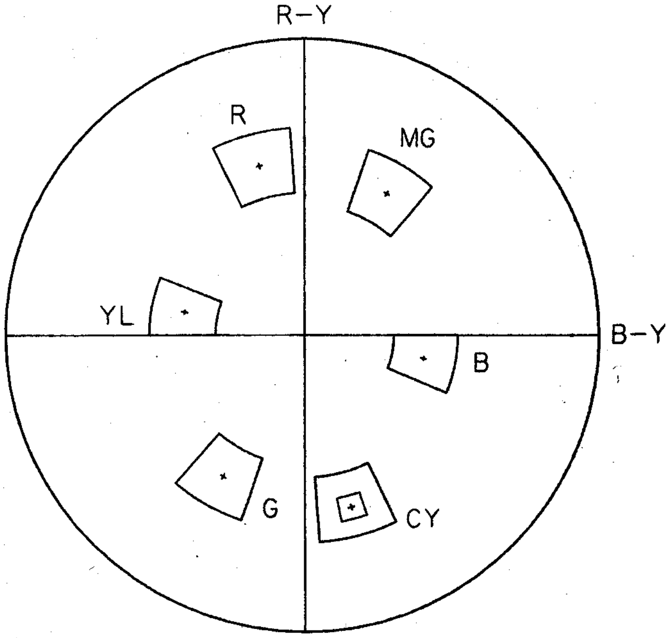
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.


R-Y
MG
R
YL
B-Y
B
CY
G

Color Reproducibility Adjustment


R-Y
R
MG
YL
B-Y
B
G
CY

Chroma Phase/Gain Adjustment

CCD-F401/F402

For Vectorscope

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SECTION 1
GENERAL

This section is extracted from CCD-F401 instruction manual.

Introduction

Thank you for purchasing a Sony Handycam ® camcorder. With your Handycam you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

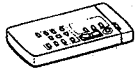
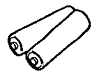
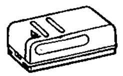
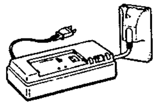
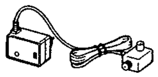
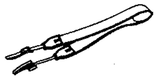
About This Manual

This manual will show you how to operate the unit. To get the most out of the features of Handycam, we recommend you read this manual thoroughly. But if you want to shoot immediately, please read the chapters, **Getting Started** and **Basic Camera Operation.** Once you are familiar with basic operations, you may want to proceed to the chapter, **Advanced Camera Operation.**

- When you are reading through this manual, please remember that buttons and settings on the camcorder are in capital letters:
  e.g. Set POWER to CAMERA.
- Use "Identifying the Parts" as an index to looking for a function and operation according to the indication printed on the camcorder itself.

Checking Supplied Accessories

Please check that the following accessories are supplied with your camcorder.

• Wireless Remote Commander (1) 	• Size AA (R6) battery for Remote Commander (2) 	• Battery pack NP-66H (1) 
• AC power adaptor AC-V60/60A (1) 	• Lithium battery CR2025 (1) 	• RFU adaptor RFU-90UC (1) 
• Shoulder strap (1) 	• Lens cap (1) (attached to the camcorder) 	

Before You Start

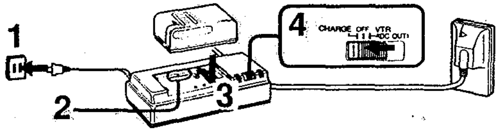
Before you can start recording, you need to:
1 Charge and install the battery pack.
2 Install the lithium battery.
3 Set the date and time.
4 Insert a tape.
5 Adjust the viewfinder lens to your eyes.
6 Set the BEEP switch.

Let's go through these procedures step by step!

Charging and Installing the Battery Pack

Before you can use this camcorder, you need to charge and install the battery pack.

Charging the Battery Pack



1 Plug the AC power adaptor into a wall outlet.
2 Align the flat side of the battery pack with the line on the AC power adaptor.
3 Push down and slide the battery pack in the direction of the arrow.
4 Set the CHARGE/VTR switch to CHARGE.

Required charging time:

Type of battery pack	NP-66H (supplied)	NP-77H	NP-77	NP-55
Required charging time	100	140	120	60

(approx. minutes using AC-V60/60A)

When charging is finished, the charge indicator will go out.

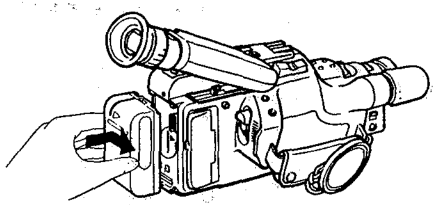
Important!

Use the battery completely before charging!

Before you recharge the battery, make sure the battery has been used (discharged) completely to avoid capacity down of the battery caused by excessive charging.

To use up the battery, remove the video cassette and simply slide POWER to CAMERA with the battery attached, and leave the camcorder until the ▭ mark appears blinking and a red lamp blinks in the viewfinder.

Installing the Battery Pack



When you have finished charging the battery, install the battery pack as follows:
1 Align the flat side of the battery pack with the line on the camcorder.
2 Make sure that the arrow on the battery pack is close to the top of the camcorder.
3 Push down and slide the battery pack in the direction of the arrow.

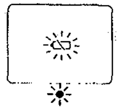
Note
Make sure the battery is securely installed so that it does not fall. If the battery is not installed properly, the camcorder will not record accurately.

A fully charged battery pack lasts for:

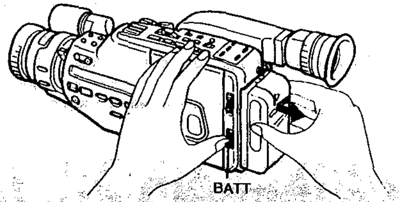
Type of battery pack	NP-66H (supplied)	NP-77H	NP-77	NP-55
Battery life	85	110	90	50

(approx. minutes, continuous recording when used indoors)

When the battery becomes weak, the ▭ indication and red lamp blink in the viewfinder. Wait until they blink rapidly, then replace the battery pack with a fully charged one.



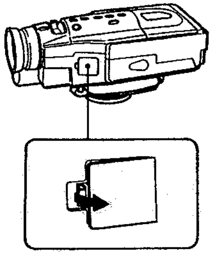
To remove the battery pack Slide BATT up, and at the same time, slide out the battery pack to the left.



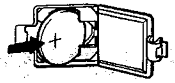
Installing the Lithium Battery

To keep a title and birth dates in the camcorder's memory as well as to activate the clock, lithium battery must be installed.

1 Use your fingernail to open the cover of the lithium battery compartment on the bottom of the camcorder.



2 Install the supplied CR2025 lithium battery with the + side facing out.



3 Close the cover.

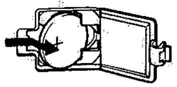
Lithium battery life

The battery will last for approximately 1 year in normal operation. When the lithium battery becomes weak, the 🔋 indication will blink in the viewfinder screen for about 5 seconds when you set POWER to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025. Use of any other battery may present a risk of fire or explosion.**

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, readjustments of the date, time, title and birth dates will be necessary.

To remove the lithium battery

Press the side of the battery in the direction as indicated for installation.

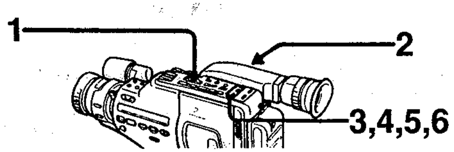


Warning

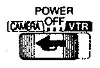
Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Setting the Date and Time

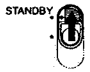
Now, let's adjust the clock inside the camcorder to be able to superimpose date and time onto your video.
Make sure that power source and lithium battery are attached.



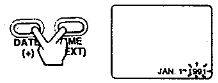
1 Press the small green button on POWER and slide POWER to CAMERA.



2 Push the cover of the red button up until it snaps into STANDBY.

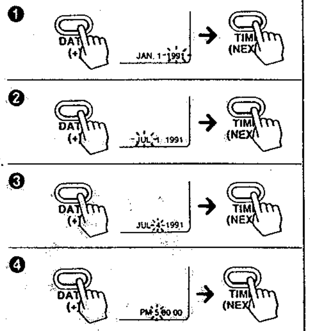


3 Press DATE (+) and TIME (NEXT) simultaneously for more than one and a half seconds until the date indication appears in the viewfinder.
DATE button now functions as + (to advance numbers) and TIME button functions as NEXT (to set).

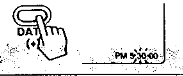


4 Adjust the flashing digits of the year, month, day, and hour using DATE (+), and press TIME (NEXT).

Notes
- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1991 and proceeds as follows:
  1991→1999→2000→2020



5 Adjust the flashing digits of minute using DATE (+).



6 Press TIME (NEXT) to set the second to "00".
The clock starts operating.

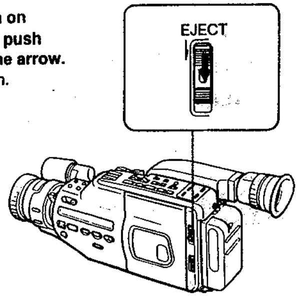
To correct date and time setting

Repeat steps 3 to 6.

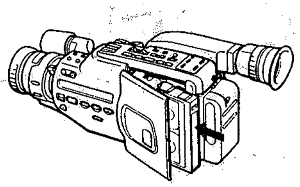
Inserting a Tape

Make sure that the battery pack or other power source is attached.

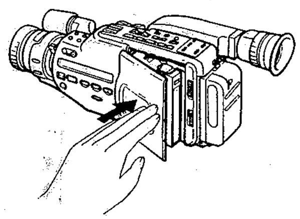
1 Press the small blue button on EJECT and simultaneously push EJECT in the direction of the arrow.
The cassette holder will open.



2 Insert a tape with the window facing outside.

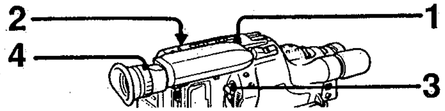


3 Close the cassette holder by pressing the area marked "PUSH".

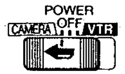


Adjusting the Viewfinder Lens

You may want to adjust the viewfinder lens to best fit your eyesight when you use this camcorder for the first time, or when you use it after someone else did. Make sure that a battery pack or other power source is attached to the camcorder.

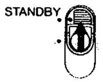


1 Press the small green button on POWER and slide POWER to CAMERA.

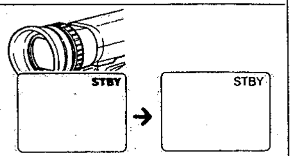


2 Insert a tape.
(See page 10.)

3 Push the cover of the red button up until it snaps into STANDBY.

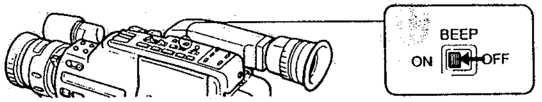


4 Turn the ring around the viewfinder lens until the "STBY" indication displayed in the viewfinder screen comes into sharp focus.



Setting the BEEP Switch

This beep sound is to help you cofirm when you start and stop recording.
When BEEP is set to ON, it will beep once when you start recording and beep twice when you stop recording.
It will also beep several times as a warning of any unusual conditions of the camcorder.
If you want to deactivate the beep, set BEEP to OFF.



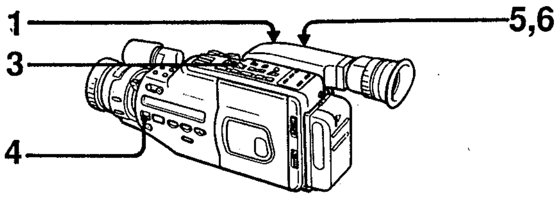
Notes
- Beep will not be recorded on the tape.
- For warning beep, see page 74.

Now it's ready for recording!

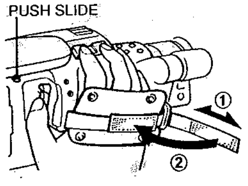
How to Record

Before you record one-time events, make a trial recording to make sure that the camcorder is working perfectly.

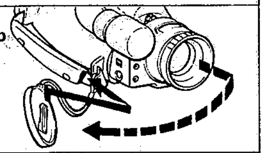
It is very easy to start recording scenes.



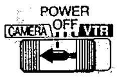
1 **Hold the camcorder by putting your hand through the grip belt so that your thumb can easily press the red START/STOP button.**
If your nose touches the camcorder, press PUSH SLIDE and adjust the position and angle of the viewfinder.



2 **Remove the lens cap and attach it to the grip belt.**

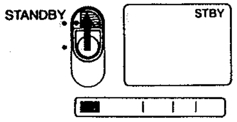


3 **Press the small green button on POWER and slide POWER to CAMERA.**
This will put camcorder in camera recording mode.

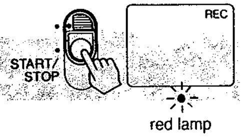


4 **Set AUTO LOCK to the green position.**
This will make every adjustment automatic.

5 **Push the cover of the red button up until it snaps into STANDBY.**
Now, you can see through viewfinder. "AUTO LOCK" appears in the display window.



6 **Press START/STOP (red button) once.**
The camera is recording when the word "REC" appears on the viewfinder screen and the red lamps light in the viewfinder and on the camcorder.
You can also confirm the start of recording with beep sound when you have the BEEP switch turned on.



In the viewfinder you can see a black and white picture of what you are recording and information that indicates what the camcorder is now doing.

Automatic recording	With AUTO LOCK set to the green line, all the camera functions are on automatic (i.e. autofocus, auto iris, auto white balance) and the shutter speed is set at normal (1/60 second.)
To stop recording momentarily	Press START/STOP again. "STBY" appears in the viewfinder. It beeps twice when you have BEEP turned on.
When you have finished recording	1 Push the cover of the red button down to cover the START/STOP button. 2 Slide POWER to the center OFF position.
Ejecting the tape	Make sure that you have attached the battery pack or other power source to the camcorder. 1 Press the small blue button on EJECT, and at the same time push EJECT in the direction of the arrow. 2 Take out the tape. 3 Press the PUSH mark on the cassette holder to close it.
About the sports finder	This camcorder is equipped with the sports finder. As the focul length of this finder is long, you can monitor the picture while being away from the eyecup.

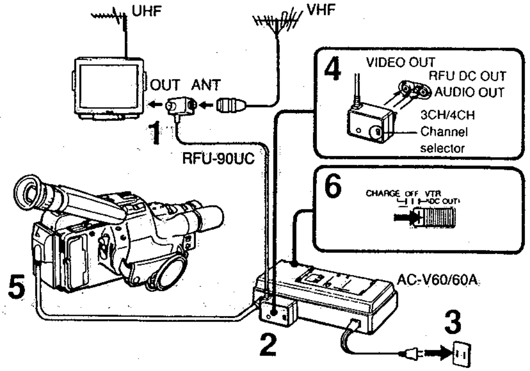
Caution!
Please remember that you can only use 8-mm format video tapes with this camcorder, and that is not possible to use PCM recording/palyback available on some 8 mm recorders. The PCM sound recorded or after-recorded with other recorder cannot be played back with this camcorder. You will be able to record tapes in SP (standard play) mode only and play back tapes in both SP and LP (long play) modes.

How to Play Back a Tape

You can use this camcorder as a VCR by connecting it directly to your TV for playback. After you connect this camcorder to your TV, use the Remote Commander for convenient control of the camcorder.

If Your TV Has Only an Antenna Input

There are several ways to connect the camcorder to your TV. Please check whether your TV has video/audio inputs. If your TV has only an antenna input, use the supplied RFU adaptor and AC power adaptor. The playback sound will be monaural. Make sure that the TV is turned off to prevent speaker damage before hooking up your camcorder.
If your TV has video/audio inputs, see page 50.



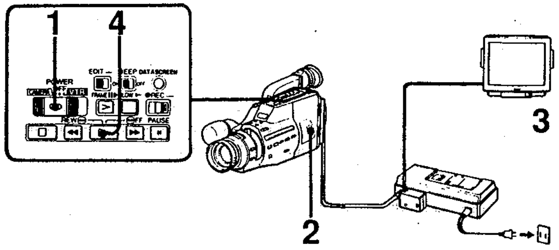
To add your camcorder connection to your TV which is already connected with regular TV (VHF) antenna, you need to:

1 Unplug the antenna cable from your TV first.
  Plug in the tail end of the RFU adaptor marked OUT to the antenna input of your TV. Re-wire the antenna cable you unplugged to the RFU adaptor jack marked ANT. This way, you can switch between TV broadcasting and your home video playback without re-wiring.
2 Connect the RFU adaptor to the AC power adaptor.
3 Connect the AC power adaptor to a wall outlet.
4 Set the channel selector on the RFU adaptor (and your TV channel) to 3 CH or 4 CH of the VHF channel, whichever is not active (vacant) in your area.
5 Attach the connecting plate of the AC power adaptor to the camcorder.
6 Make sure the CHARGE/VTR selector on the AC power adaptor is set to VTR position.

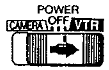
You may want to keep the AC power adaptor and RFU adaptor connected to your TV once you have established the connection. This way you can easily connect your camcorder to your TV just by attaching the connecting plate of the AC power adaptor to the camcorder. (Steps 5 and 6)

When you want to switch to regular TV program, set the CHARGE/VTR selector to OFF or turn off the power of the camcorder.

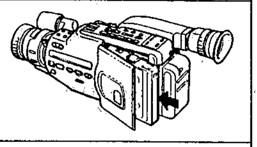
How to Play Back a Tape



1 **Press the small green button on POWER and slide POWER to VTR.**



2 **Insert a tape, if it is not in the camcorder.**



3 **Turn on the TV and select the channel that you adjusted the RFU adaptor (3 CH or 4 CH).**
If you are connecting with video/audio inputs, set TV's TV/VIDEO selector to VIDEO.

4 **Press ▷.**

To stop playback, press □.
To rewind the tape, press ◀◀.
To advance the tape rapidly, press ▶▶.

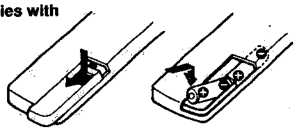
When you have finished playback

1 Slide POWER to the center OFF position.
2 Set CHARGE/VTR on the AC power adaptor to OFF.

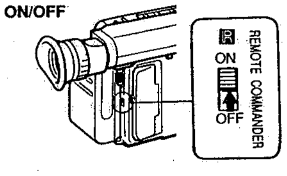
Using the Remote Commander

By using the Remote Commander, you can record yourself with your friends or family, or conveniently control the playback of your tape from a distance.

1 Insert two size AA (R6) batteries with correct polarity.

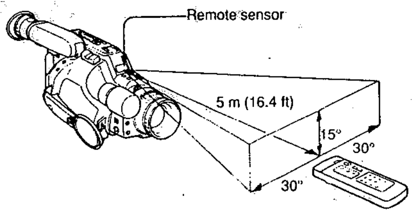


2 Set REMOTE COMMANDER ON/OFF on the camcorder to ON.



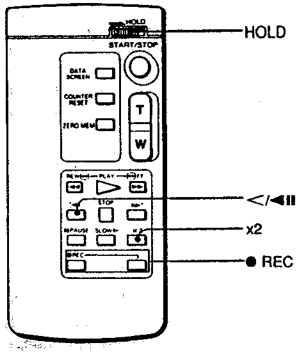
3 Set POWER on the camcorder as follows:
- When recording, 1) press the small green button on POWER and slide POWER to CAMERA, 2) push the cover of the red button up until it snaps into STANDBY.
- When playing back, slide POWER to VTR.

4 Point the Commander to the remote sensor of the camcorder and press the appropriate button on the Commadner.



(Maximum distance and angle for remote control)

Getting familiar with some buttons



HOLD switch
When you slide the switch in the direction of the arrow, all the buttons will become inoperable to prevent any misoperation when you accidentally press the buttons.

</◀II (reverse direction/reverse frame) and x2 (double speed playback) buttons
You can use the functions of these buttons only with the Commander.

●REC buttons
When you record in the VCR mode, press these two buttons simultaneously.

Battery life

In normal operation, batteries will last up to six months. If the camcorder does not operate properly, the batteries might be exhausted. Replace both batteries with new ones.

To avoid damage from possible battery leakage

Remove the batteries when you will not use the Commander for a long time.

When you connect the receiver of a remote control kit

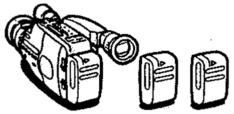
When you connect the receiver of a remote control kit (not supplied) to the REMOTE ⬖ control connector, be sure to set REMOTE COMMANDER ON/OFF on the camcorder to OFF.

How to Get the Most out of Your Battery Pack

How to Prepare the Rechargeable Battery Pack

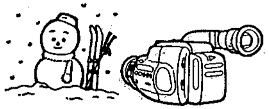
Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned.

"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.



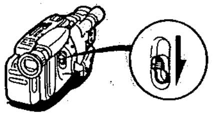
Battery life is shorter in a cold climate.

Battery efficiency is decreased and the battery will be used up more quickly.



Turn STANDBY of the camcorder off when not recording to save battery power.

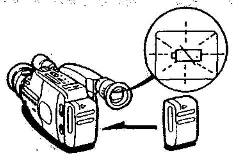
A smooth transition between scenes can be made even if recording is stopped and started again.
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used.
The battery is also used when a tape is inserted or removed.



When the Rechargeable Battery Pack Should Be Replaced

When the ▭ mark and red lamp in the viewfinder change from slow blinking to rapid blinking while you are recording.

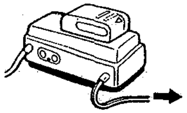
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth transition between scenes after the battery pack is replaced.



Notes on Charging

Before using the battery pack, charge it sufficiently.

A brand new battery pack is not charged.



Make sure you use up the battery before recharging.

- If recording is completed before the ▭ mark appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, push the cover of the red button up until it snaps into STANDBY, and leave the camcorder until the ▭ mark blinks rapidly.
- Repeated charging without using up the battery may cause lowering of battery capacity. However, the original battery capacity can be recovered if you fully discharge (use up) and charge the battery again.

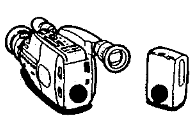
Recharge the battery pack after long storage.

If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again but in this case the battery life will be shorter than normal.
After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.



Notes on the Rechargeable Battery Pack

Why the battery pack heats up?

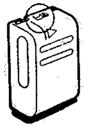
During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack, and this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is in the camcorder, a small amount of current flows to the camcorder even if POWER is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging.
  Thus, it is recommended you charge the battery right before using.

How to use the switch on the battery pack

This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.



How many times can the battery pack be recharged?

It can be fully charged and discharged about 500 times under normal temperatures.
If the ▭ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Recommended temperatures during charging

Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C (5°F to 85°F) is recommended.

Connecting Alternative Power Sources

You can choose any of the following power sources for your camcorder: battery pack (see page 6), alkaline batteries, house current, and 12/24 V car battery. The appropriate power source for you to choose depends on the place where you want to use your camcorder.

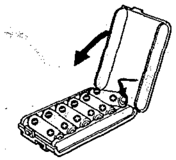
Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-66H (supplied), NP-77H, NP-77 or NP-55
	Alkaline batteries	Battery case EBP-55
Indoors	House current	AC power adaptor AC-V60/60A (supplied), AC-V30 or AC-V55
In the car	12 V or 24 V car battery	DC pack DCP-77 or DCP-55

Note on power sources Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. In this case, supply the power again immediately.

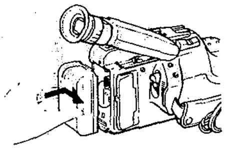
Using Alkaline Batteries

The EBP-55 battery case (not supplied) is required .

1 Insert the six size AA (R6) alkaline batteries into the battery case.



2 Attach the case in the same way as the battery pack. (See page 7.)



Battery life The battery life is approx. 40 minutes (continuous recording when used indoors).

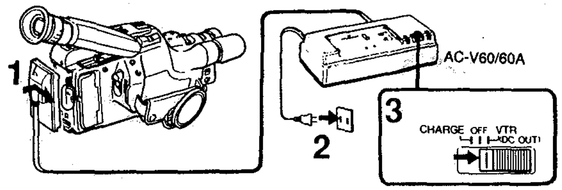
To remove the battery case Proceed in the same way as the battery pack. See page 7.

Notes on battery life

- Batteries will not last as long in cold places.
- No indication appears in the viewfinder to warn of a weak battery.

Using House Current

The supplied AC-V60/60A AC power adaptor is required.



1 Align the flat side of the connecting plate with the line on the camcorder, and push down and slide it in the direction of the arrow.

2 Connect the AC power adaptor to a wall outlet.

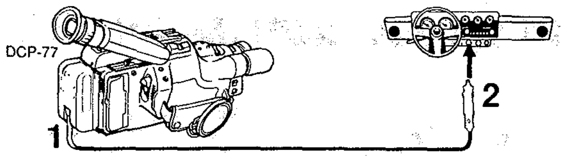
3 Set the CHARGE/VTR selector of the AC power adaptor to VTR.

See the instruction manual of the AC power adaptor for details.

To remove the connecting plate Remove it the same way as you do with the battery pack. See page 7.

Using Car Battery

The DCP-77 DC pack (not supplied) is required.



1 Align the flat side of the DC pack with the line on the camcorder, and push down and slide it in the direction of the arrow.

2 Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).

To remove the DC pack Proceed in the same way as the battery pack. See page 7.

Options

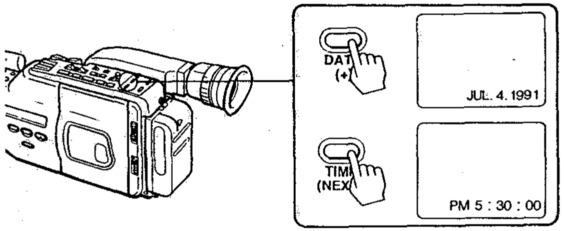
- AC-V55 AC power adaptor:
  You can charge two battery packs continuously using this adaptor and the house current. By connecting this adaptor with the DCC-16AW car battery cord, you can use your camcorder with the car battery.
- BC-55, BC-77 portable battery charger:
  You can charge a battery pack on 100-240 V AC.
- DC-V30 car battery charger:
  You can charge a battery pack through the cigarette lighter socket.

Camera Recording

In the previous chapter "Basic Camera Operation", you learned the basic recording operations. This section shows you how to record the date or time, record in a strong wind, re-record a picture, prevent accidental erasure, and more.

Recording the Date or Time

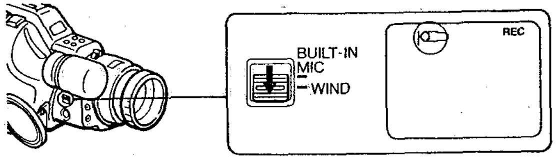
Date or time can be superimposed on your recording.



During camera recording or when in standby mode, press DATE for date indication or TIME for time indication.
The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE or TIME again.
The picture recording continues.

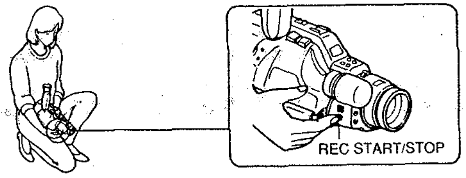
Recording in a Strong Wind



Set BUILT-IN MIC to WIND. The wind noise will be reduced. Wind mark ⊂⊃ will appear in the viewfinder.
After recording, return it to the green position.

For Low-position Recording

You can also record from low position using separate REC START/STOP button to get an interesting recording angle.



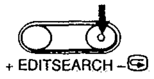
Adjust the viewfinder (It can be turned 90 degrees up.)
Press REC START/STOP in front of the camcorder.
To stop recording, press it again.

Checking the Last Portion of a Scene You Just Recorded (EDITSEARCH)

You can check the last portion of a scene you just recorded without changing the setting of the POWER switch using EDITSEARCH.

1 Set the camcorder in standby mode by pressing the START/STOP button.

2 Press the – ⊖ side of EDITSEARCH momentarily.
The last few seconds of the recorded portion will be played back in the viewfinder. After a few seconds of playback, the camcorder goes back to standby mode, ready for next recording.

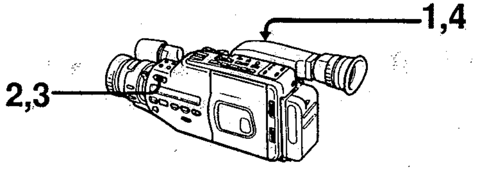


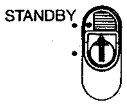
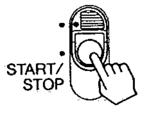
Hints for Recording

If the tape reaches near the end during recording	The ⊠ indication and the red lamp in the viewfinder and the camera recording/battery lamp on the camcorder blink slowly. When the tape reaches its end, blinking becomes rapid and beeps sound for about five seconds (if BEEP is set to ON.)
Notes on recording	• To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back. • When moving from indoors to outdoors, or vice versa, push the cover of the red button up until it snaps into STANDBY and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.
Note on standby mode	If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, push the cover of the red button down once and push it up again. To start recording, press START/STOP directly.
Note on light sources	If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder to the other direction.

Re-recording on a Previously Recorded Portion (EDITSEARCH)

You can reshoot a scene over the last recorded portion using EDITSEARCH. The previously recorded portion will be erased.



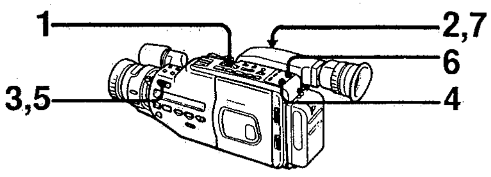
1 **Push the cover of the red button up until it snaps into STANDBY.**	
2 **Look in the viewfinder and find the point from where you want to begin recording by:** Keep pressing the + side of EDITSEARCH continuously to advance the picture at a normal playback speed, or the – side to reverse the picture.	+ EDITSEARCH -
3 **At the desired point, release EDITSEARCH.**	
4 **Press START/STOP.** Recording begins from the point you released EDITSEARCH. A smooth transition between scenes can be made after the pre-recorded portion even if the cover of the red button is pushed down and pushed up, or even if the power is turned off and on again, provided that the tape is not removed.	

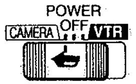
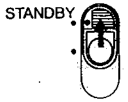
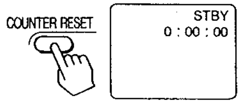
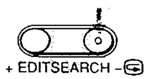
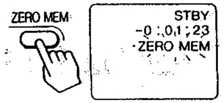
To pause recording Press START/STOP again.

To stop recording Push the cover of the red button down to cover START/STOP.

Inserting Scene in the Middle of a Recorded Tape

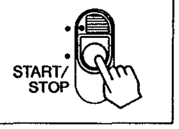
You can insert a scene in the middle of a recorded tape by setting the starting point and ending point. A previously recorded portion will be erased.



1 **Press the small green button and slide POWER to CAMERA.**	
2 **Push the cover of the red button up until it snaps into STANDBY.**	
3 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.** The camcorder is set to standby mode.	+ EDITSEARCH -
4 **Press COUNTER RESET.** The counter is reset to zero.	
5 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**	
6 **Press ZERO MEM.** The insert ending point is stored in memory.	

(To be continued)

7 **Press START/STOP.**
Insert recording begins. The insert recording stops automatically at the counter zero point.

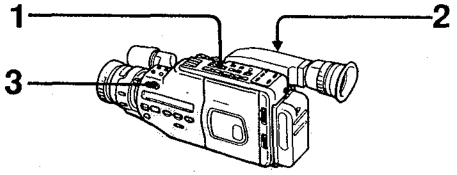


To cancel the ZERO MEM Press ZERO MEM.

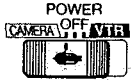
Note The picture may be distorted at the ending point when played back.

Checking Recording in the Viewfinder (EDITSEARCH)

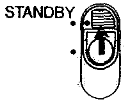
You can check the recorded picture in the viewfinder using EDITSEARCH. Sound cannot be monitored.



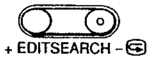
1 **Press the small green button, and slide POWER to CAMERA.**



2 **Push the cover of the red button up until it snaps into STANDBY.**



3 **Keep pressing the + or – side of EDITSEARCH to view the playback picture:**
+ side for the playback picture
– side for the playback picture in reverse.



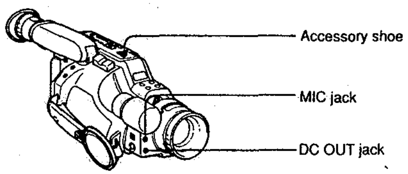
To stop playback Release EDITSEARCH.

To monitor the sound while viewing the playback picture in the viewfinder

1 Connect an earphone to the ⊚ (earphone) jack.
2 Press the small green button and slide POWER to VTR.
3 Press ◀◀ to rewind the tape and press ☐ where you want to stop.
4 Press ▷ to start playback.

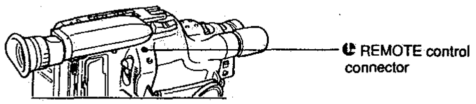
Recording with an External Microphone

You can connect an external microphone (stereo or monaural, not supplied) to the MIC jack. This jack also accepts a "plug-in-power" microphone. If the microphone has two plugs, connect the DC IN plug to the DC OUT jack. Attach the microphone to the accessory shoe of the camcorder.



Connecting a Wired Remote Control Unit

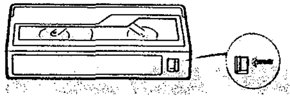
When you connect a wired remote control unit or editing controller (not supplied) to the ⅌ REMOTE control connector, you can operate your camcorder from a distance.



About ⅌ (LANC) ⅌ stands for Local Application Control Bus System. The ⅌ connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

Preventing Accidental Erasure

Slide the tab on the cassette to expose the red mark. This will prevent accidental recording.
To re-record on this tape, slide the tab back out covering the red mark.
If you try to record with the red mark exposed, the ▭ and ≜ indications blink in the viewfinder and you will hear beep sound about five seconds.



Note on handling tapes Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of tape, or if the red mark is exposed or covered, etc. Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

Making Manual Adjustments

The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for effective recording. You can manually adjust the following items with this camcorder:

- Focus
- White balance
- Back light compensation
- Shutter speed

In addition, when you use the PROGRAM AE (Auto Exposure) function under the manual mode, you can get a scene like a portrait or clear picture in the still and slow motion playback.

What is PROGRAM AE (Auto Exposure)?

Program AE automatically selects just the right combination of shutter and aperture settings and gives you creative control of depth of field (distance range of object that will be in sharp focus). There are two preprogrammed modes; Portrait and Sports. (See pages 35 and 36.)

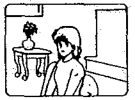
Function of the AUTO LOCK switch

When you set AUTO LOCK to the green position, white balance, back light and/or shutter speed is returned to the normal setting regardless of the control setting. And focus is retained to autofocusing. Turning on the AUTO LOCK switch disables these control buttons. Turning off (at the lower white position) the AUTO LOCK switch does not automatically result in setting all of these items to manual. This merely enables the control buttons to be set manually. Some shooting situations may call for using some items manually, while others call for using them automatically.
As long as you do not remove the battery, even if you set POWER to OFF, the previous manual settings are retained.

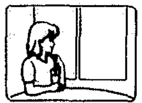
Focusing Manually

In the following cases you would obtain better results by adjusting the focus manually.

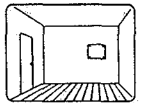
Insufficient light



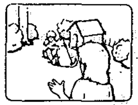
Too much brightness behind the subject



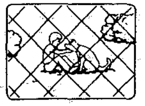
Subjects with little contrast-wall, sky, etc.



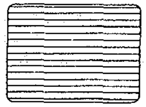
One subject is close; the other is in the center, but at a distance.



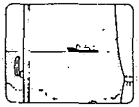
Subjects beyond nets, etc. or another subject passes in front of the camcorder



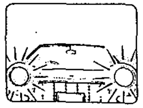
Horizontal stripes



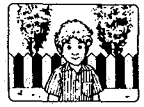
Subject through frosted glass



Bright subject or subject reflecting light



High contrast behind the subject (The background may be focused.)



When you use conversion lenses or effect filters
When shooting in close-up (Macro)
When shooting a stationary subject using a tripod
To save battery wear

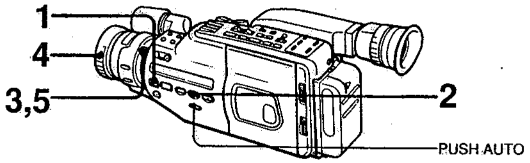
Autofocusing does not function momentarily when:

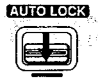
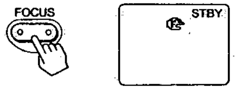
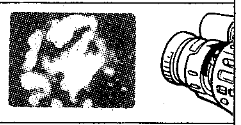
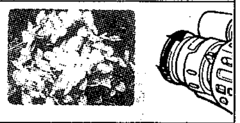
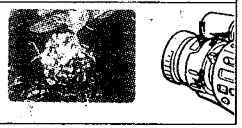
- The shutter speed is changed, or the back light adjustment is changed to manual mode.
- Lighting conditions change quickly.
- Zooming is done from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations,

How to focus manually

When adjusting focus manually, best way is to first adjust at telephoto position before recording, then set the desired zoom angle.
Let's go through step by step.



1 **Set AUTO LOCK to the lower position.**	
2 **Press FOCUS.** The Ⓕ indication appears in the viewfinder.	
3 **Turn the manual zoom lever fully to the telephoto position.**	
4 **Turn the focus ring to achieve sharp focus.**	
5 **Set the desired shot length using the manual zoom lever, while pressing the gray button for wide-angle.**	

Shooting with autofocusing momentarily

While shooting with manual focusing, press PUSH AUTO.
The autofocusing functions **while you are pressing the button**. When you release the button, manual focusing will be resumed. Use this button when you change the focus from one subject to another. The focusing performs naturally.
The previous settings except for focusing are retained.

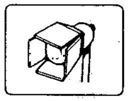
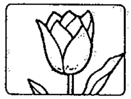
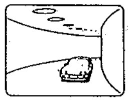
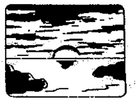
Some helpful hints

- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, set the zoom lever to the wide-angle position and the focus ring to 2 to 3 m (7 to 10 ft).

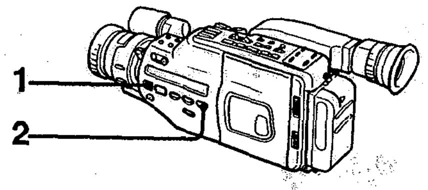
Adjusting the White Balance

What is white balance?

White balance adjustment means to get most natural color temperature under certain lighting condition.
In the following cases, you would obtain better results by adjusting the white balance manually.

Conditions		Inidcation in the viewfinder
	Lighting conditions change quickly	☼ (indoor)
	Too bright, such as in photograph studios	☼
	Monochromatic subject or background	HOLD
	Under a sodium lamp	☼
	Under a mercury lamp	☼
	Under a color matching fluorescent lamp	☀ (outdoor)
	Recording outdoors: a night view, neon signs or fireworks	☀
	Recording outdoors: scenes after sunset or before sunrise	☀

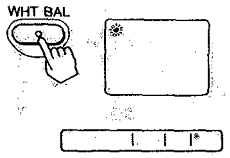
How to adjust the white balance



1 **Set AUTO LOCK to the lower position.**

2 **Select the desired white balance mode by pressing WHT BAL.**
Each time you press the button, the indication in the viewfinder and the display window changes as follows:

No inidcation → HOLD → ☀ → ☼
↑___________________________|



Note on manual adjustments

When moving from indoors to outdoors, or vice versa, set AUTO LOCK to the green position and adjust the white balance in auto mode, then reset the white balance manually.

Keeping the White Balance Setting (HOLD Mode)

What is the HOLD mode?

In the HOLD mode, the camcorder automatically adjusts the white balance according to the color temperature of the subject's light source and keeps that setting during recording. When recording some subjects with different color temperatures (when lighting condition changes often), use the HOLD mode. Then, you can achieve a recording with natural colors without being affected by the surroundings.

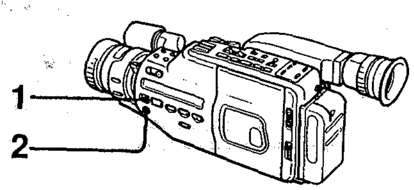
To set into the HOLD mode

1 Set AUTO LOCK to the lower position and press WHT BAL to set to Auto (no indication).
2 Point at and record a white, flat object such as a white wall, or paper.
If you cannot find a white object, you may want to attach the lens cap and direct the camcorder to light sources.
3 Press WHT BAL.
The HOLD mark appears in the viewfinder.

When you change the battery pack or setting of the white balance, or the light source is changed, you need to set to the HOLD mode again. In this case, follow the procedures above again.

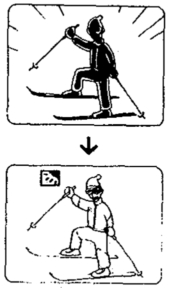
Compensating Backlighting

In this camcorder, the exposure is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button to get natural exposure.



1 **Set AUTO LOCK to the lower position.**

2 **Press BACK LIGHT.**
The ▣ indication appears. If it does not appear, press the button again.



Subject is too dark because of backlight.

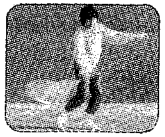
With backlight compensation

After shooting

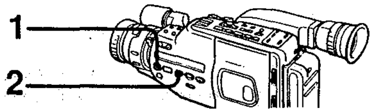
Be sure to release this adjustment condition by pressing BACK LIGHT again. (The ▣ indication goes out.)
Otherwise, picture will be too bright under normal lighting condition.

Using the High-speed Shutter

When you record a fast-moving subject, choose a higher shutter speed. The movement will look clearer when played back in the pause mode. Remember that you need enough lighting to use high speed shutter.

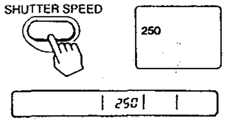


How to select the shutter speed



1 **Set AUTO LOCK to the lower position.**
Make sure that neither 👤 nor 🏃 appears in the display window.

2 **Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.**



→ No indication (1/60) → 100 (1/100) → 250 (1/250) →
4000 (1/4000) ← 2000 (1/2000) ← 1000 (1/1000) ←

How to choose best shutter speeds

Example use	Recommended shutter speed
• On clear days, recording golf or tennis swing (To view the hit ball clearly in the still picture mode, set to 1/4000) • Recording skiers	1/4000 or 1/2000
• On overcast days, recording a moving carousel or roller coaster • Recording outdoors from inside a moving vehicle (for stable shooting)	1/1000 or 1/250
• Instead of the ND2 filter (To reduce the exposure level to about a half) • Recording indoor sports (for stable shooting)	1/100

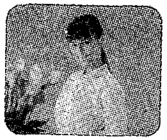
Notes

- When you select shutter speed 1/250 or faster, record under sunlight or use a video light.
- When you record a TV screen with certain shutter speeds, the brightness of the recorded picture may vary.
- When you shoot a very bright subject at a faster shutter speed, a light vertical, belt-like line ("smear") may appear on the screen.
- When you record at certain shutter speeds under a light discharged tube, such as a fluorescent lamp, sodium lamp or mercury lamp, the brightness of the recorded picture may vary.

Using the Portrait Mode

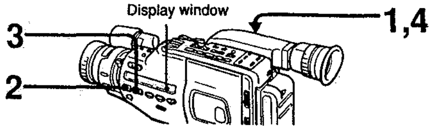
👤

In the portrait mode, the object is in focus and the background is out of focus. Therefore, you can use this mode to highlight the subject. The opening of the iris and the shutter speed is automatically adjusted to maintain the appropriate exposure according to the size and brightness of the object. The portrait mode is most effective to be used outdoors.



You may want to use the portrait mode when shooting the following subjects:
- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- subjects behind such obstacles as net

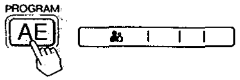
How to set to portrait mode



1 **Push the cover of the red button up until it snaps into STANDBY.**

2 **Set AUTO LOCK to the lower position.**

3 **Press PROGRAM AE until 👤 appears in the display window.**



4 **Press START/STOP.**
Recording with the portrait mode starts.

To resume the automatic mode

Press PROGRAM AE until neither 👤 nor 🏃 appears in the display window or set AUTO LOCK to the green position.

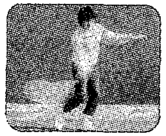
Hint for effective camera work

Use of the portrait mode in the following method will gradually bring the background out of focus while keeping the object in focus.
1 Enter the portrait mode.
2 Set AUTO LOCK to the green position and start recording.
3 Set AUTO LOCK to the lower position.
The camcorder will enter the portrait mode and brings the background out of focus.

Note

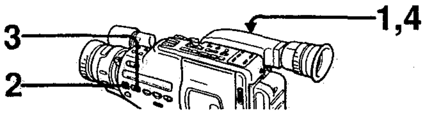
When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the color of the recorded picture may become unnatural.

Using the Sports Mode



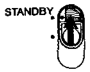
In the sports mode, you can record subjects moving at high speed clearly, providing a high-quality picture minimum blur in the slow and still playback modes. The shutter speed and the opening of the iris is automatically adjusted to maintain the appropriate exposure according to the speed of the object. The sports mode provides more effective recording than you can achieve by using the SHUTTER SPEED button.

You may want to use the sports mode when shooting the following subjects:
- outdoor sports scene such as football, tennis or golf
- recording a landscape in a moving car

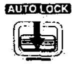


How to set to sports mode

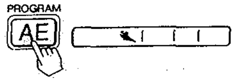
1 **Push the cover of the red button up until it snaps into STANDBY.**



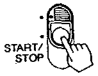
2 Set **AUTO LOCK to the lower position.**



3 **Press PROGRAM AE until ⛷ appears in the display window.**



4 **Press START/STOP.**
Recording with the sports mode starts.



To resume the automatic mode

Press PROGRAM AE until neither 🎥 nor ⛷ appears in the display window or set AUTO LOCK to the green position.

Hint for effective camera work

When shooting sports event from a distance, such as a football game, we tend to zoom from the wide to the telephoto position to catch the one-time events. Even under these circumstances, by using the sports mode, you can get a sharp picture when played back later in the slow or still mode.

Notes

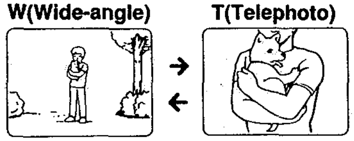
- The sports mode is effective under sufficient lighting, such as under sunlight. When used under extremely dark conditions, the shutter speed may not be shifted to high speeds.
- When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the color of the recorded picture may become unnatural.

Using the Special Effects

You can get a professional-looking home video using these sepcial effects; zoom, close-up, fade-in and fade-out.

Zooming

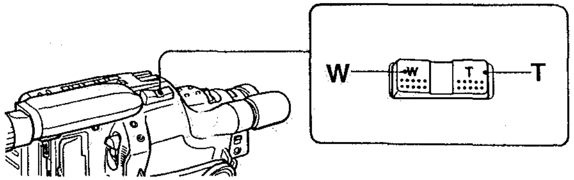
You can change the size of the subject in the scene. Use zooming to focus manually or to decide the shooting angle. Also use "zoom-in (Telephoto)" for dramatic close-ups. Use "zoom-out (Wide-angle)" for panoramic long shots. Most common mistake, however, is using zoom-in or zoom-out too often during recording. For natural recording, you may want to set the zoom first and then start recording.



You can zoom using motorized power zoom or manually with zoom lever.

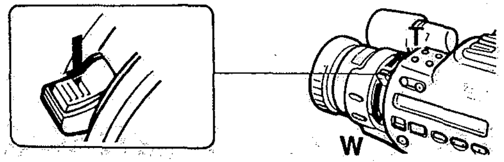
Power zooming

Use the power zoom for smooth and constant zooming.
Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).



Zooming manually

Use the manual zoom to create a dramatic effect or to change zoom angle quickly.
Turn the manual zoom lever upward for telephoto and downward for wide-angle.
Be sure to keep pressing the gray button on the lever when turning it downward.



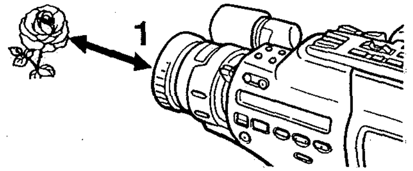
Focal length of this camcorder

The focal length is 8.5 mm to 68 mm ($^{11}/_{32}$ to $2^{3}/_{4}$ inches). This means approximately 46 mm to 368 mm ($1^{3}/_{4}$ to $14^{3}/_{8}$ inches) converted into the focal length of a 35-mm still camera.

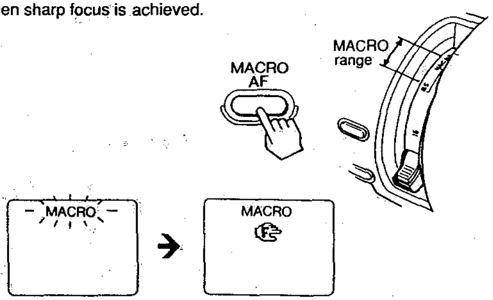
Close-up (Autofocusing in Macro)

Even small subjects, such as flowers, insects and photographs can fill the screen with autofocusing in macro.

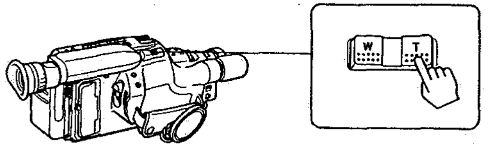
1 Bring the camcorder as close as necessary to obtain the desired subject size.
This subject can be as close as a minimum of 10 mm ($^{13}/_{32}$ inches) from the lens surface.



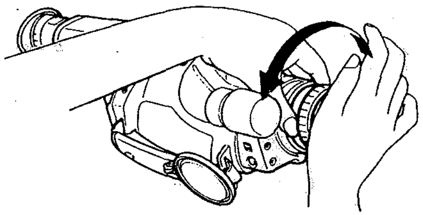
2 Press MACRO AF.
The MACRO indication blinks in the viewfider and the zoom lever turns automatically to the MACRO range.
The MACRO and ⓕ indications light steadily when sharp focus is achieved.



To release this adjustment setting	Press the T side of the power zoom button or return the zoom lever to the ordinary range.



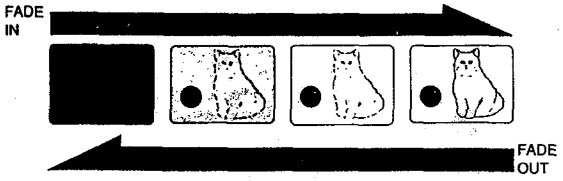
If the MACRO indication lights before focusing sharply	The MACRO indication lights steadily if sharp focus cannot be achieved within 30 seconds. In this case, press MACRO AF again to re-function autofocusing in macro. If you still do not get a sharp focus, manual focusing is recommended (see page 30). Adjust it after the MACRO indication lights steadily.
To keep autofocus functioning	Keep MACRO AF pressed. Contrary to the normal autofocusing, autofocusing in macro is released each time the sharp focus is achieved.
Notes	• This function has no connection with the AUTO LOCK switch. You can use autofocusing in macro while manually adjusting the ordinary focus, etc. • Do not press the power zoom button while the zoom lever is moving for autofocusing in macro. Otherwise, autofocusing is released.
Manual focusing in macro	1 Turn the zoom lever to the MACRO range without pressing the gray button on it. The MACRO indication lights up in the viewfinder. 2 Turn the zoom lever within the MACRO range to focus sharply.
If the lens hood touches the subject	Remove the lens hood. Hold the focus ring and turn the hood by pressing it with your palm. Do the same when attaching/removing a filter or conversion lens (not supplied).



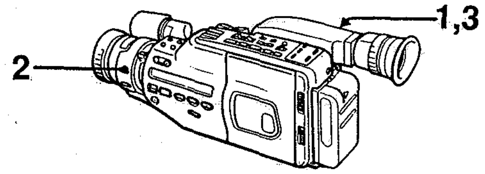
Recommeded accessory	When shooting in macro, the depth of field is very shallow, so pay attention to focusing. To keep the subject in focus, use a tripod.

Fade-In and Fade-out

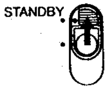
You can fade-in or fade-out to give your recording a professional appearance.
When fading-in, the picture will gradually appear from black.
The sound will also be gradually increased.
When fading-out, the picture will gradually fade to black. The sound will be decreased.



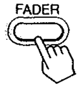
To fade-in



1 **Push the cover of the red button up until it snaps into STANDBY.**

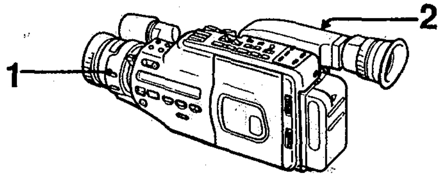


2 **Press FADER.**



3 **Press START/STOP.**
Fade-in is performed and recording will start.

To fade-out



1 **While recording, press FADER.**

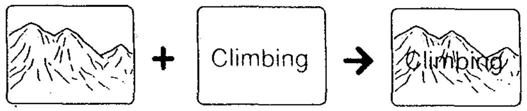
2 **Press START/STOP to stop recording.**
Fade-out is performed and then recording stops.

To cancel the fade-in/out function	Before pressing START/STOP, press FADER again.
If you want to use the fade-in/out function repeatedly	Start from step 1 each time.
When the date/time (page 22), title (page 44), or age (page 49) is displayed	The title, date/time, or age does not fade-in or fade-out.

Superimposing Text

You can superimpose your own hand-written message or graphics over the scene during recording or playback. You can also superimpose how many years and months have passed since your child's birthday, or the date of a memorable occasion. Remember that information you want to superimpose must first be stored in the camcorder.

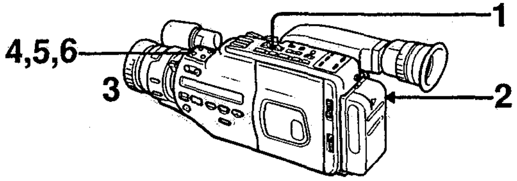
Title superimposing



Storing a Title in Your Camcorder

You can choose from eight colors for your title.
Before you store the title, make a title card. Use plain, white card and write a title with a dark-colored marker in thick letters.
Before you begin, make sure that the lithium battery is installed.

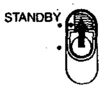
How to store



1 **Press the small green button on POWER and slide POWER to CAMERA.**

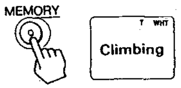
POWER
CAMERA
OFF
VTR

2 **Push the cover of the red button up until it snaps into STANDBY.**



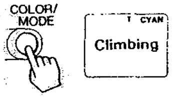
3 **Point the camcorder to the title card and adjust the focus.**

4 **Press MEMORY to store the title.**

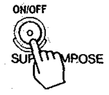


5 **Press COLOR/MODE to select the title color.**
Each time you press the button, the indication changes as follows.

WHT (white) → BLUE → GRN (green) → CYAN → RED
BLK (black) ← YEL (yellow) ← VIO (violet)



6 **Press ON/OFF to turn off the title.**



To check the title

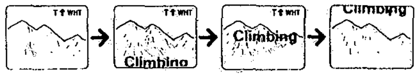
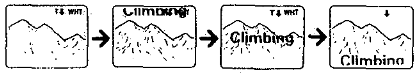
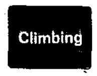
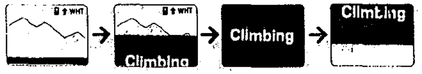
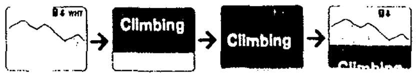
Press ON/OFF in the standby mode.
To turn off the title, press the button again.

Putting a Title on Your Tape

What you can do with the title

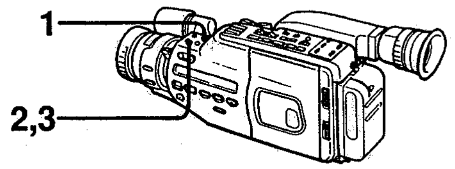
- You can scroll your title like scrolling credits in a movie.
- You can reverse the title.
- You can record the title on the connected VCR when you edit a tape.
- In addition to superimposing a title at the point you want, you can automatically display or clear the title. The nicest way to use this method is at the beginning or at the end of the tape. (Auto-superimposing)

Various display modes of the title

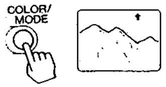
Display mode	Indication in the viewfinder
Scrolling up the title The title scrolls up and stops at the center. 	↑
Scrolling down the title The title scrolls down and stops at the center. 	↓
Reversing the title with the picture 	▯
Scrolling up the reversed title 	▯↑
Scrolling down the reversed title 	▯↓
Normal display mode	No indication
Auto-superimposing	∟AUTO

How to superimpose

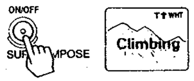
The following shows how to superimpose text using an example in which the title in white scrolls up.



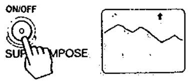
1 **Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.**
(For display modes, see page 43.)



2 **Press ON/OFF at the point you want to insert the title in the standby mode, during recording, in the playback pause mode or during playback.**
You can change the title color by pressing COLOR/MODE. Each time you press the button, the color indication changes.



3 **Wait for a while and press ON/OFF again.**
The title will go out.



About the color and the display mode indications

The color and the display mode indications in the viewfinder are not recorded.

If you press EDITSEARCH in standby made

The title goes out. After performing the editsearch or recording review function, the title appears again.

Note on scrolling

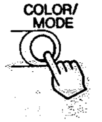
You can scroll the title only when the camcorder is in the recording standby, recording, or normal playback mode. In the other modes (see "Playing Back a Tape in Various Speeds" on page 52), you can select only reversing (▯) or normal display mode. Also scrolling will be cancelled when you set the camcorder in the other modes after selecting scrolling.

About memory back up

The camcorder uses the lithium battery on the bottom to keep the title in memory. The lithium battery life is approximately 1 year.

Function of the COLOR/MODE button

This button has a double function: one is to select the title color and the other is to select the title display mode.
Its function depends on if the title is displayed or not.



To select the color

1 Press ON/OFF to display the title.
2 Press COLOR/MODE.
Each time you press the button, the color indication changes as follows:
WHT (white) → BLUE → GRN (green) → CYAN → RED
└ BLK (black) ← YEL (yellow) ← VIO (violet) ←┘

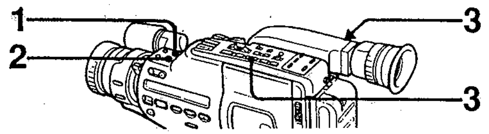
To select the display mode

1 If the title is displayed, press ON/OFF so that the title disappears.
2 Press COLOR/MODE.
Each time you press the button, the mode indication changes as follows:
No indication (normal mode) → ↑
└ ▯↓ ← ▯↑ ← ▯ ← ↓ ┘

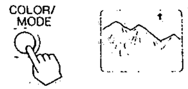
↑ : Title scroll up mode
↓ : Title scroll down mode
▯ : Title reverse mode
▯↑ : Title reverse and scroll up mode
▯↓ : Title reverse and scroll down mode

Superimposing a title at the beginning

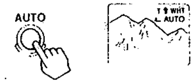
You can clear the title automatically after displaying it for a few seconds. (Auto-superimposing)



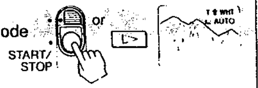
1 **Press COLOR/MODE to select the display mode of the title in the standby or playack pause mode.**



2 **Press AUTO.**

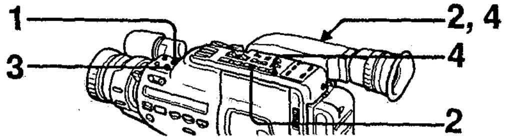


3 **Start recording or playback.**
The title is displayed in the selected mode and disappears after a few seconds automatically.

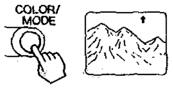


Superimposing a title before the tape stops

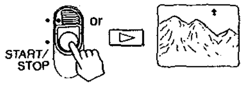
You can display the title automatically for a few seconds after pressing START/STOP or II PAUSE to stop recording or playback. (Auto-superimposing)



1. **Press COLOR/MODE to select the display mode of the title in the standby or playback pause mode.**

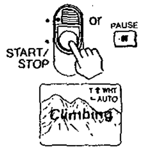


2. **Start recording or playback.**



3. **Press AUTO.**

4. **Press START/STOP or II PAUSE at the point which you want to stop recording or playback. After the title is displayed for a few seconds, recording or playback stops.**



The auto-superimposing is cancelled when

- The auto-superimposing is performed once.
- You press AUTO again before the superimposing is performed.
- Other operation (e.g. editsearch or various speed playback) is done in the standby or playback pause mode.
- You press ON/OFF before superimposing is performed.

Storing a Birth Date in Your Camcorder

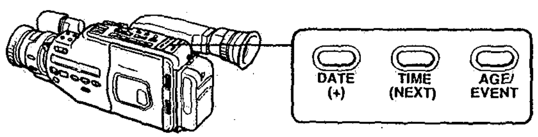
When you preset your child's birth date in the camcorder, you can put your child's age in years and months on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside the camcorder will automatically update age of your child. You can superimpose the age anytime on your recording. You can preset up to three birth dates or events.

Before you begin

Before you store a birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

How to store birth date

To store a birth date in your camcorder, see the following example and procedure.
Example: Store "Aug. 3, 1987" in memory 2.

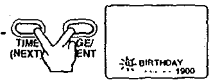


1. **Press the small green button on POWER and slide POWER to CAMERA.**

POWER
CAMERA
OFF
VTR

2. **Press the cover of the red button up until it snaps to STANDBY.**

3. **Press TIME (NEXT) and AGE simultaneously for more than one and a half seconds until the "[1] BIRTHDAY-- -- 1900" indication appears in the viewfinder.**



4. **Press DATE (+) to select [2].**
   Each time you press DATE (+), the display in the viewfinder changes as follows:
   [1] BIRTHDAY → [2] BIRTHDAY
   ↑—— [3] EVENT* ←——

   * Although "EVENT" is displayed on [3], you can use it for age as well.
   [1] and [2] can also be used for event.

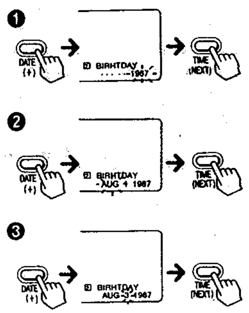
DATE
(+)
BIRTHDAY
1900

5. **Press TIME (NEXT).**
   The "1900" indication blinks.

TIME
(NEXT)
BIRTHDAY
1900

(To be continued)

6 Enter the birth date of your child.
First adjust the blinking digits with DATE (+), and then press TIME (NEXT).
The age (year and month) appears when all the items are adjusted.



If you missed the correct number with DATE (+)

Keep pressing DATE (+).
The indication changes as follows:
Year: 1900 → 1901 → Current year
↑
Current year – (minus) 99 ←┘

Month: JAN. → FEB. - - - → DEC. → - -

Day: 1 → 2 - - - → 31

To correct/change the setting

Follow the procedures from step 1 again.

To advance the digits faster

Keep DATE (+) pressed.

To preset the year before 1900

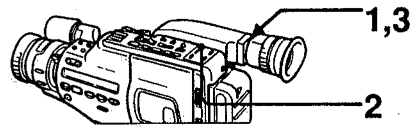
1 After step 5 on page 47, keep pressing DATE (+) until the current year is displayed.
2 Press DATE (+) again.
The year goes back 99 years.
(example: 1990 → 1891)
3 Go to step 6 above.

When in 2000

"--- --1901" is displayed in step 3 on page 47. After that, it advances every year as "1902, 1903, ... ".

Putting an Age on Your Tape

You cannot add the age later during playing back or editing. Be sure to follow the procedure below.



1 During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.
The camcorder is set in standby mode.

2 Press AGE to select the indication you want to record.
Each time you press AGE, the indication changes as follows:

No indication → $\boxed{1}$ The first age
↑ ↓
$\boxed{3}$ The third age ← $\boxed{2}$ The second age

An item with no presetting is skipped.
The $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ indication goes out after one second.

3 Press START/STOP.
Recording starts again.
The indication in the viewfinder is recorded with the picture.

To stop recording the age

Press AGE until the indication goes out.

To change the display while recording

Press AGE until the indication you want to record is displayed. Recording of the indicator you select starts when $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ goes out.

To cancel the stored birth date

1 Perform steps 1 to 4 in "Storing a birth date in you camcorder" to select the memory number to be canceled.
2 Press TIME (NEXT) twice. The month indication blinks.
3 Press DATE (+) until "--- --" appears.
4 Press TIME (NEXT).
The birth date is deleted from the memory and is not displayed when you press AGE.

About memory back-up

The camcorder uses the lithium battery on the bottom to keep the birth date in memory. The lithium battery life is approximately 1 year.

When you connect the camcorder to a TV during recording

If you do not use the data-screen function, the age indication will appear on the TV screen when the $\boxed{1}$, $\boxed{2}$, or $\boxed{3}$ indication goes out in the viewfinder and recording starts.

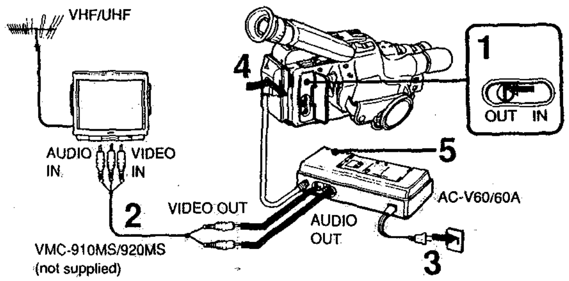
Playing Back

In the earlier section (page 14), we've explained the basic connection to your TV.
Here, we will talk about several other ways of connection to TV depending on the type of TV you have.
You can easily make a proper connection of camcorder and TV by using the *supplied AC-V60/60A AC power adaptor.*
If you connect a TV not equipped with video/audio inputs, see page 14.

Connecting a TV with Video/Audio Inputs

How to connect a TV with video/audio inputs

Use the supplied AC-V60/60A AC power adaptor and A/V connecting cable to connect to the TV. Make sure that the TV is turned off to prevent damage to the speaker.



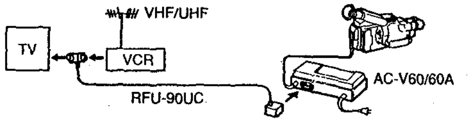
1 Set the IN/OUT selector to OUT.
2 Connect Video and Audio using the A/V cable between TV and AC power adaptor.
If your TV is a monaural type, use the VMC-710M/720M A/V connecting cable (not supplied).
3 Connect the AC power adaptor to a wall outlet.
4 Attach the connecting plate of the AC power adaptor to the camcorder.
5 Set the CHARGE/VTR selector on the AC power adaptor to VTR (DC OUT).

Note
Perform only steps 4 and 5 when playing back a tape. You can keep the AC power adaptor and the TV connected when playing back a tape.

Connecting to a TV via a VCR

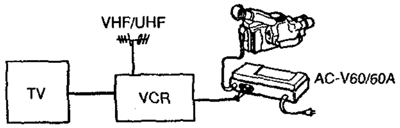
If your TV has no VIDEO/AUDIO input jacks

Disconnect the antenna connection between the TV and the VCR, and connect the RFU adaptor to the VHF/UHF input of the TV and VHF/UHF output of the VCR.



If your TV has VIDEO/ AUDIO input jacks

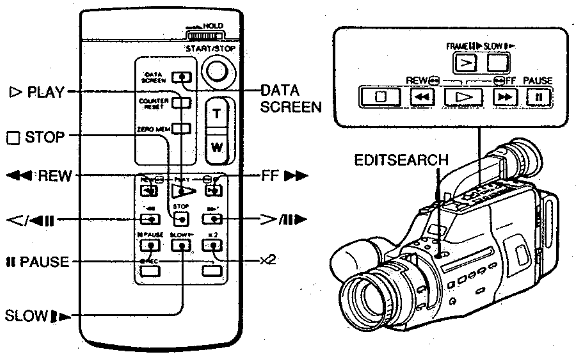
Connect Video and Audio from the AC power adaptor to the VCR instead of to the TV. Set the input selector of the VCR to LINE, if available.



Playing Back a Tape in Various Speeds

The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the REMOTE COMMANDER switch to ON.

To make the same indications in the viewfinder on the TV
Press DATA SCREEN.
To turn the indications off, press it again.
This DATA ON SCREEN on TV will tell you which playback mode you are using.



To view the still picture (playback pause)
Press II PAUSE during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or II.

Note
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

To change the playback direction
Press </◀II for the reverse or >/II▶ for the forward direction during playback. > on the camcorder is only for the forward direction.
–x1 or x1 appears in the viewfinder.

To view the picture at 1/5 speed (slow playback)
Select the playback direction with </◀II or >/II▶, and then press I▶ SLOW during playback.
I▶ SLOW on the camcorder is only for the forward direction.
◀I or I▶ appears in the viewfinder.
Note
To resume normal playback, press ▷.
When slow playback lasts for 1 minute or more, the forward or reverse playback at the normal speed starts automatically, depending on the tape direciton.

To view the picture at double speed (only on the Commander)
Select the playback direction with </◀II or >/II▶, and then press x2 on the Commander.
–x2 or x2 appears in the viewfinder.
To resume normal playback, press ▷.

To view the picture frame-by-frame
In the still picture mode, press </◀II or >/II▶. Each time you press the button, the picture appears by a frame.
II▶ on the camcorder is only for the forward direction. ◀II or II▶ appears in the viewfinder.
If you keep pressing ◀II/II▶, playback at 1/30 speed starts.
To resume normal playback, press ▷.

To locate the desired scene (picture search)
Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ⏪ or ⏩ appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly (skip scan)
Press ◀◀ during rewinding or ▶▶ during advancing the tape rapidly. ⏪ or ⏩ appears in the viewfinder.
To resume normal playback, press ▷.

About the playback picture
During the various playback modes, streaks appear on the screen.

About the sound during playback in the various playback mode
The sound can be heard during playback at double speed in forward direction, but sound may not be clear as normal speed playback.

If the still picture, frame-by-frame picture, or slow playback picture is noisy
Set the camcoder into the slow playback mode, and press "+" or "–" side of EDITSEARCH on the camcorder until you get the best picture.

If the still picture shakes
Press "+" or "–" side of EDITSEARCH on the camcorder until the most stable picture appears.

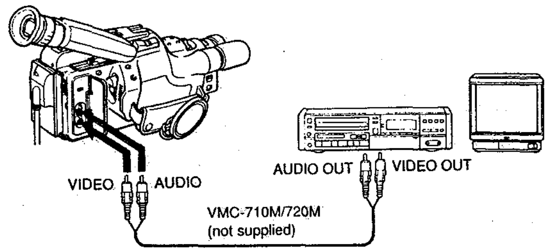
Recording

Recording from a VCR or TV

You can record a tape from another VCR or a TV program from the TV both equipped with video/audio outputs.

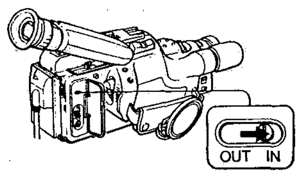
How to connect

Disconnect the RFU adaptor from the AC power adaptor if it is connected. Make connection using the appropriate A/V cable (such as Sony VMC-710M/720M for monaural equipment or VMC-910MS/920MS for stereo equipment).



How to record

1 **Set the IN/OUT selector on the camcorder to IN.**



2 **Turn on the VCR or TV.**

3 **Play back the tape or select the TV channel to be recorded.**

4 **Set POWER of the camcorder to VTR.**

5 **Insert a tape and slide ● REC.**
Recording starts. You can monitor the picture being recorded in the viewfinder.

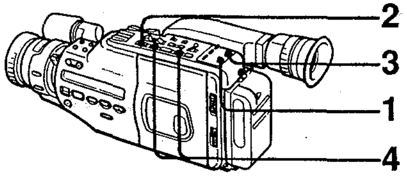
Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

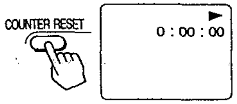
To count the whole tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

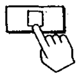
To return to a pre-registered point



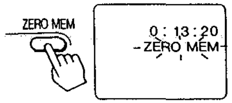
1 **During playback, press COUNTER RESET at the point you later want to locate.**
The counter shows "0:00:00".



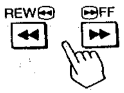
2 **Press □ when the playback has finished, as usual.**



3 **Press ZERO MEM.**
The "ZERO MEM" indication blinks in the viewfinder.
Be sure to press ZERO MEM after you stop the tape. It does not function during recording or playback.



4 **Press ◀◀ or ▶▶.**
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.



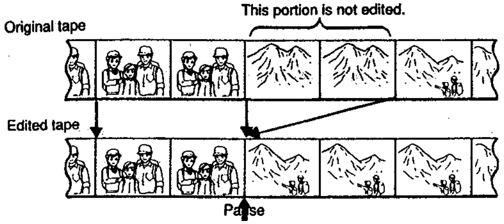
Notes on the tape counter and the ZERO MEM button

- Something must be recorded on the tape in order for the tape counter to function.
  Tape counter will not work on blank tape.
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
  There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point where you pre-registered.

Editing

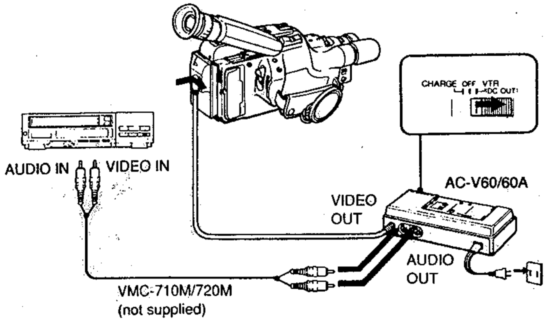
Editing Tapes with a VCR

You can edit a tape with an additional ⑧ 8mm, β Betamax or VHS VHS format VCR. Also you can superimpose and record the titles.



How to connect

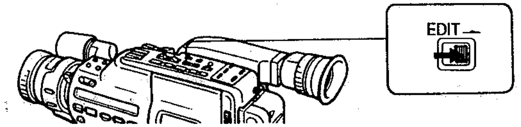
Make connections using the appropriate A/V cable (such as Sony VMC-710M/720M for monaural VCR or VMC-910MS/920MS for stereo VCR) and set the CHARGE/VTR selector on the AC power adaptor to VTR. Set the input selector of the VCR to LINE, if available.



How to edit

1 **Insert a tape to be recorded into recording VCR.**

2 **Slide EDIT on the camcorder to the direction of the arrow.**



3 **Set POWER of the camcorder to VTR, then insert the recorded tape.**

4 **Play back a tape on the camcorder until you locate the point where you want to start editing, then set the camcorder to the playback pause mode.**

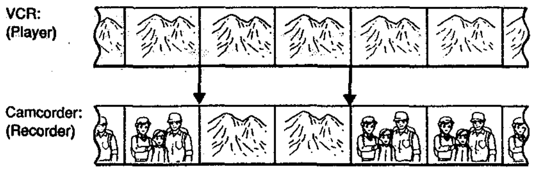
5 **On the recording VCR, locate the recording starting point and set the VCR to the recording pause mode.**

6 **Press ‖ PAUSE of the camcorder and VCR simultaneously to start editing.**

Note on auto-superimposing	When performing synchronized editing using the ⏀ connector, you cannot superimpose a title at the end of the editing by pressing AUTO.
To edit more scenes	Repeat steps 4 to 6.
To stop editing momentarily	Press ‖ on the recording VCR.
To stop editing	Press □ on both VCRs.
To record a title	You can superimpose and record the titles on the picture while editing. For details, refer to pages 41 to 46.
If you use the DATA SCREEN function	The indications displayed on the TV screen will also be recorded.
Use of the EDIT switch	When you set EDIT to the direction of the arrow (EDIT ON), you can keep picture and sound deteriorations resulting from editing to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

Replacing Recordings on a Tape (Insert Editing)

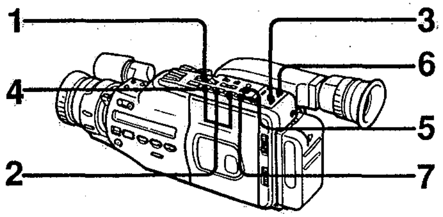
You can insert a new scene from a VCR on your originally recorded tape by setting the starting point and ending point.



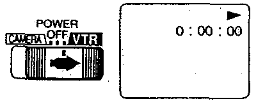
How to connect

Connections are the same as in "Recording from a VCR or TV (page 54)." Before you begin replacing recordings, **set the VCR to the playback pause mode at the beginning of the scene to be recorded.** Set the CHARGE/VTR selector on the AC power adaptor to VTR.

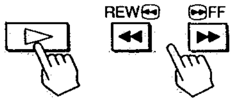
How to replace recordings



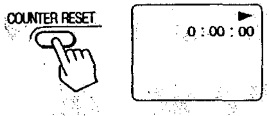
1 **Press the small green button on POWER and slide POWER to VTR.**
The counter appears in the viewfinder.



2 **Locate the end point where the insert should end by pressing ◀◀ or ▶▶ during playback.**

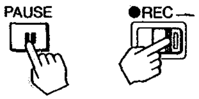


3 **At the end point, press COUNTER RESET.**
The counter is reset to "0:00:00".

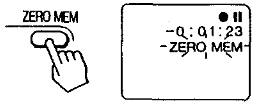


4 **Locate the start point where the insert should begin by pressing ◀◀.**

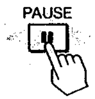
5 **At the start point, set the camcorder into recording pause mode.**



6 **Press ZERO MEM.**
The end point of the insert is stored in memory.



7 **Press II of both units to start insert editing.**
You can monitor the picture being inserted in the viewfinder screen.



The insert recording will stop automatically near the zero point on the counter.

To change the end point

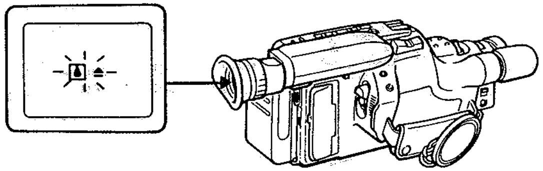
Press ZERO MEM so that the ZERO MEM indication disappears, and operate again from step 2.

Maintenance Information

Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

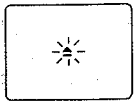
If moisture condenses inside the unit



Moisture is present inside the camcorder when:
- The ▣ indication in the viewfinder blinks.
  When the tape is inserted, the ⏏ indication also blinks.
- Several beeps sound continuously for five seconds when the BEEP switch is set to ON and the tape is inserted.

In such cases, no function except for tape ejection will work.
Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used again if the ▣ indication does not appear when the power is turned on again.

If moisture condenses on the surface of the tape



Moisture is present on the surface of the tape when:
- The ⏏ indication blinks inside the viewfinder when the tape is inserted and a tape transport button (▷, ◀◀, etc.) is pressed.
- Several beeps sound continuously for about five seconds when the BEEP switch is set to ON.

In such cases, no function except for tape ejection will work.
Eject the tape and let the camcorder and the tape sit for at least 1 hour.
The tape can be used again if the ⏏ indication does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indications will appear, but the picture becomes dim.
Turn off the power and leave the camcorder unused for at least 1 hour.

Video Head Cleaning

Slight contamination
Critical contamination

To ensure clear picture, clean the video heads periodically

When playback pictures become noisy or hardly visible, the video heads may be contaminated.
In such case,
1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution

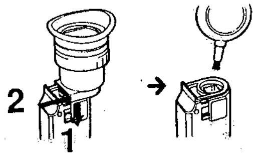
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Viewfinder Cleaning

Detach the eyecup as illustrated and clean the surface of the screen with a commercially available blower.



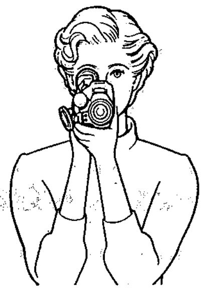
Tips for Better Camera Recording

How to Achieve Better Camera Recording

Take a good posture for shooting

For hand-held shots, it is important to hold the camcorder properly.

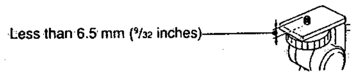
- Hold the camcorder firmly and secure it with the grip belt so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Stand opposite to the subject and let your feet take a comfortable stance.
- Place your eye firmly against the viewfinder eyecup.



Use a tripod

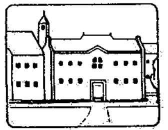
If you have a tripod for a still camera, you can also use it with the camcorder.
If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Caution
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm. Otherwise the screw may damage the inner part of the camera.



Keep the horizontal plane level

You can easily determine the horizontal plane by using the viewfinder frame as a reference.



Plan ahead

If you are going to edit the tape after recording, shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording, first record a title and then use the START/STOP button to make a smooth recording.

Lighting

Shoot with the sun behind you.
When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background.
  In this case, the face will be recorded too dark.

Use video light in the dark

To get the best colors, you must maintain a sufficient light level.
Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights are recommended since their weight and low heat output levels allow safe and direct connection to the camcorder.
Do not point the light at the camcorder. The high heat from the light may warp the casing of the camcorder.
For detailed instructions on proper use of the light, read its instruction manual.

Brightness levels

Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

Situation	Brightness	Condition
Snow-covered mountains Snow fields Sandy beach, clear day in summer	Unit: lux	ND filter recommended
Clear day, mid day (100,000 lux) Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)	100,000	Normal recording
	10,000	
Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500 – 700) Station wicket (650)	1,000	
Office lit by fluorescent lamps (400 – 500)	500	
Room lit by two 30 W fluorescent lamps (300) Subway station platform (300)	300	
Arcade at night (150 – 200)	100	
Theater lobby (15 – 35) Candlelight (10 – 15)	10	Video light recommended

Using Your Camcorder Abroad

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Difference In Color System

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be an NTSC system based TV. Check the following list (in alphabetical order).

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, The Philippines, U.S.A., Venezuela, etc.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany (former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country
Brazil

PAL N system countries
Argentina, Paraguay, Urguay

SECAM system countries
Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, Soviet Union, etc.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- Do not put the camcorder on the sand.

On care

- When the unit will not be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.

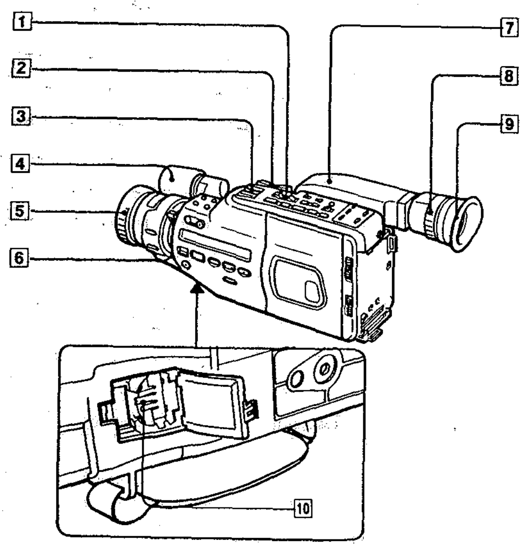
  Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Note on copyright

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Identifying the Parts

For details on the use of each part, refer to the pages indicated in the circle.



1 **Power switch**
CAMERA: for camera recording
VTR: for playing back or editing tapes
OFF: power off

2 **Power zoom button** ㊲ ㊴

3 **Accessory shoe**

4 **Built-in microphone**

5 **Lens hood/focus ring** ㉚ ㊴

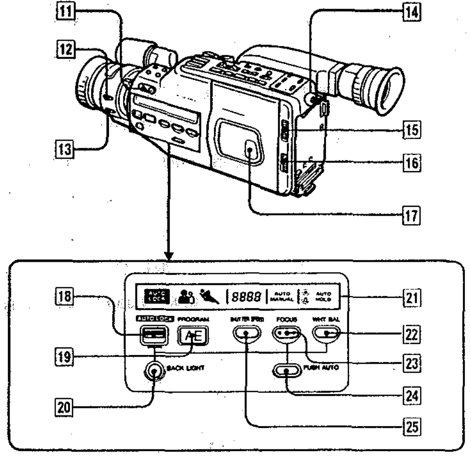
6 **Zoom lever** ㉚ ㊲

7 **Viewfinder**

8 **Viewfinder lens adjustment ring** ⑪

9 **Eyecup**

10 **Lithium battery compartment** ⑧


11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
8888
PROGRAM
AE
BACK LIGHT
FOCUS
WHT BAL
PUSH AUTO

11 **EDITSEARCH (and ⊜ recording review) buttons ㉓ ㉔ ㉕ ㉖**

12 **FADER button ㊵ ㊶**

13 **MACRO AF (macro autofocus) button ㊳**

14 **Camera recording/battery lamp ⑬**

15 **EJECT (cassette eject) knob ⑩ ⑬**

16 **BATT (battery eject) knob ⑦**

17 **Cassette holder**

18 **AUTO LOCK switch ㉘**

19 **PROGRAM AE (program auto exposure) button ㉟ ㊱**

20 **BACK LIGHT button ㉝**

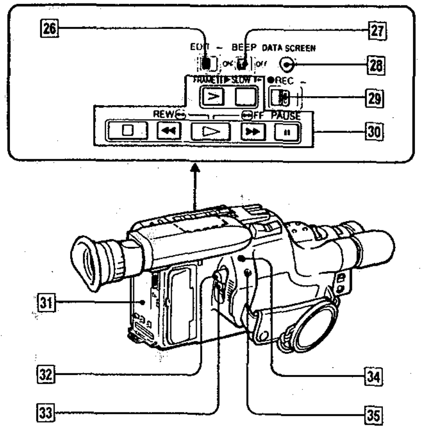
21 **Display window (72)**

22 **WHT BAL (white balance) button ㉜**

23 **FOCUS button ㉚**

24 **PUSH AUTO button ㉚**

25 **SHUTTER SPEED button ㉞**


26
27
28
29
30
31
32
33
34
35
EDIT
BEEP
DATA SCREEN
ON
OFF
FRAME
SLOW
●REC
REW
FF
PAUSE

26 **EDIT switch (57)**

27 **BEEP ON/OFF switch ⑪**

28 **DATA SCREEN button (62)**

29 **● REC (recording) switch (54)**

30 **Tape transport buttons (52)**

▷	(playback)
▶▶ FF	(fast-forward)
◀◀ REW	(rewind)
□	(stop)
❚❚ PAUSE	(pause)
>/❚❚▶ FRAME	(forward direction/frame-by-frame in forward direction)
❚▶ SLOW	(slow playback)

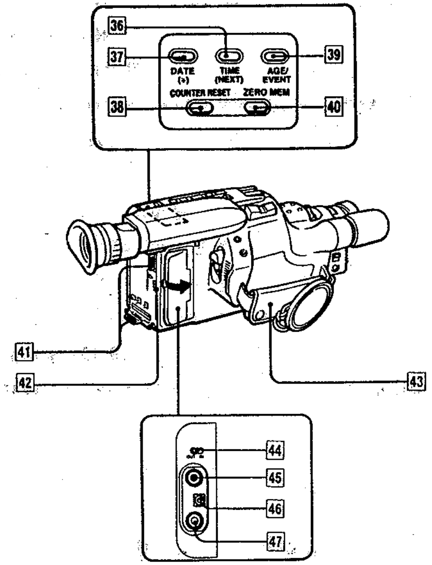
31 **Battery mounting surface ⑦**

32 **STANDBY switch**

33 **START/STOP button ⑬**

34 **⟲ REMOTE control connector (stereo mini-minijack) ㉗**

35 **◎ (earphone) jack (minijack)**


36
37
38
39
40
DATE (+)
TIME (NEXT)
AGE/ EVENT
COUNTER RESET
ZERO MEM
41
42
43
44
45
46
47

36 **TIME (NEXT) button** ⑨ ㉒ ㊼

37 **DATE (+) button** ⑨ ㉒ ㊼

38 **COUNTER RESET button** ㉕ (55)

39 **AGE/EVENT button** ㊾

40 **ZERO MEM (memory) button** ㉕ (55)

41 **Hooks for shoulder strap**

42 **R REMOTE COMMANDER ON/OFF switch** ⑯

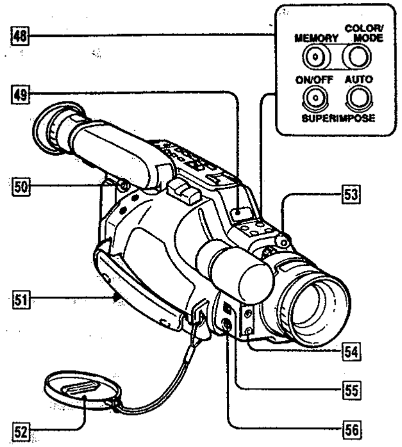
43 **Grip belt** ⑫

44 **IN/OUT (video and audio input/output) selector** ㊿ (54)

45 **AUDIO input/output jack (phono jack)** (54)

46 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**

47 **VIDEO input/output jack (phono jack)** (54)


48
49
50
51
52
53
54
55
56
MEMORY
COLOR/ MODE
ON/OFF
AUTO
SUPERIMPOSE

48 **SUPERIMPOSE buttons** ㊷
MEMORY button
COLOR/MODE button
AUTO button
ON/OFF button

49 **Remote control sensor** ⑯

50 **PUSH SLIDE (viewfinder positioning) button** ⑫

51 **Tripod receptacle (bottom)**

52 **Lens cap**

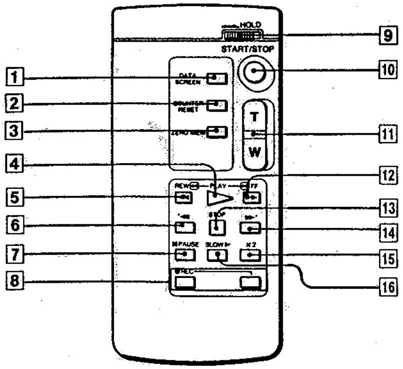
53 **Camera recording/battery lamp** ⑬

54 **MIC (microphone) jack (minijack) and DC OUT (power output) jack (mini-minijack)**

55 **BUILT-IN MIC (microphone) switch** ㉒

56 **REC (recording) START/STOP button (for low-position recording)** ㉒

Wireless Remote Commander



HOLD
START/STOP
DATA SCREEN
COUNTER RESET
ZERO MEM
T
W
REW
PLAY
FF
STOP
PAUSE
SLOW
x 2
REC
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

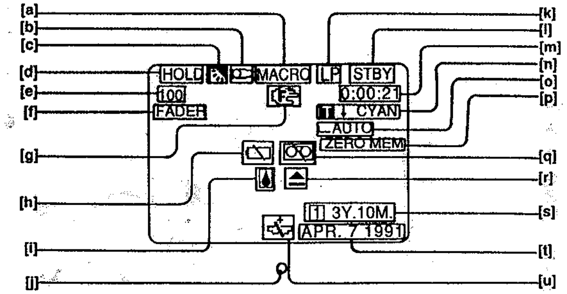
1. **DATA SCREEN button**
2. **COUNTER RESET button**
3. **ZERO MEM (memory) button**
4. **▷ PLAY (playback) button**
5. **◀◀ REW (rewind) button**
6. **< /◀II (reverse direction/reverse frame) button* (52)**
7. **II PAUSE button**
8. **● REC (Recording) buttons**
9. **HOLD switch ⑰**
10. **START/STOP button**
11. **Power zoom button**
12. **▶▶ FF (fast forward) button**
13. **□ STOP button**
14. **> /II▶ (forward direction/forward frame) button (52)**
15. **x 2 (double speed playback) button* (52)**
16. **SLOW I▶ (slow playback) button (52)**

Note

The * indicates the functions which are operable only with the Commander.

Indications Inside the Viewfinder and the Display Window

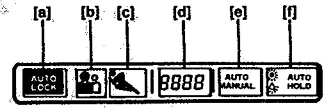
Inside the Viewfinder



HOLD
100
FADER
MACRO
LP
STBY
0:00:21
CYAN
AUTO
ZERO MEM
3Y.10M.
APR. 7 1991
[a]
[b]
[c]
[d]
[e]
[f]
[g]
[h]
[i]
[j]
[k]
[l]
[m]
[n]
[o]
[p]
[q]
[r]
[s]
[t]
[u]

[a] MACRO AF is pressed. (MACRO)
[b] WIND is selected. (⊏⊃)
[c] BACK LIGHT is pressed. (☐)
[d] White balance mode. (☀, ☼, HOLD)
[e] PROGRAM AE setting (👥, 🏃) or Shutter speed
[f] FADER is pressed.
[g] Manual focusing (F)
[h] "Exchange battery." (▭)
[i] Moisture has condensed. (▮)
[j] Lights up during recording.
When blinking: "Exchange battery or tape."
[k] Playback mode (LP)
[l] Tape transport mode
[m] Tape counter
[n] Title mode and color
[o] Auto superimpose (AUTO)
[p] ZERO MEM is pressed.
[q] "Exchange tape or no tape inside." (⊙⊙)
[r] "Trouble has occurred" (⏏) or "Clean video heads." (⊗)
[s] Age
[t] Date or time
[u] "Replace lithium battery" (▭)

In the Display Window



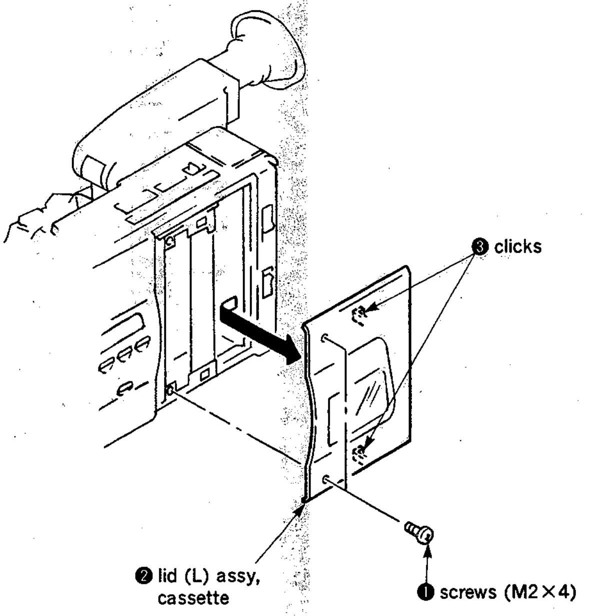
[a]
[b]
[c]
[d]
[e]
[f]
AUTO LOCK
8888
AUTO MANUAL
AUTO HOLD

[a] Appears in automatic adjustment mode
[b] Appears in portrait mode
[c] Appears in sports mode
[d] Shutter speed
[e] Focus mode
[f] White balance mode

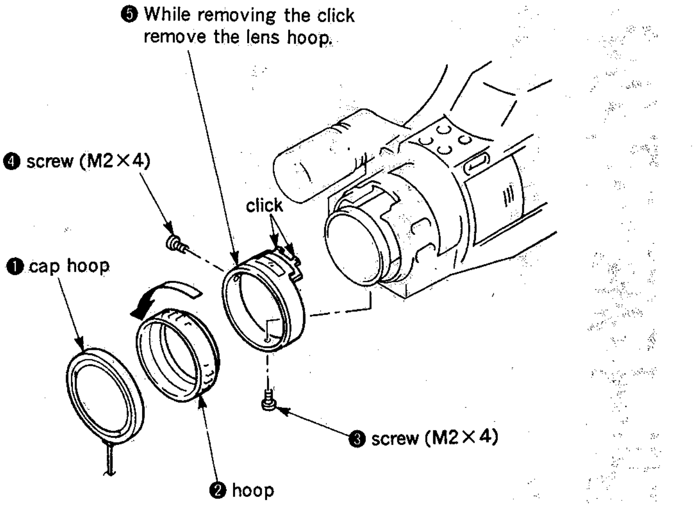
SECTION 2
DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID ASSY

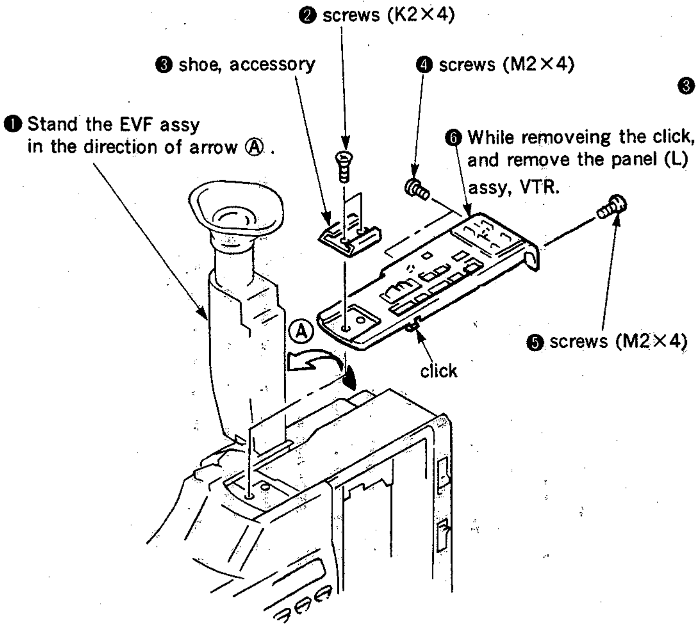
Note : When mounting, fit the click ❸ into holes completely, then clamp two screws ❶.


❸ clicks
❷ lid (L) assy, cassette
❶ screws (M2×4)

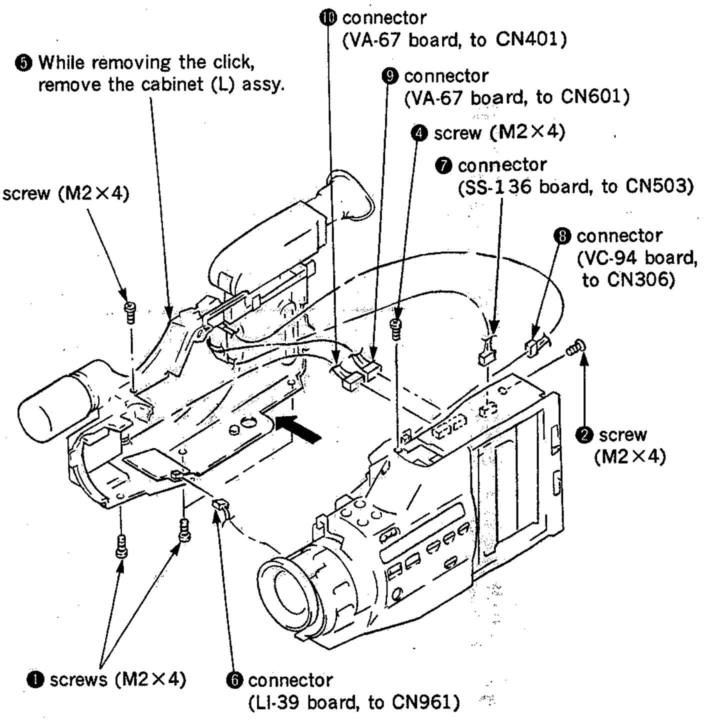
2-3. REMOVAL OF LENS HOOP


❺ While removing the click remove the lens hoop.
❹ screw (M2×4)
click
❶ cap hoop
❸ screw (M2×4)
❷ hoop

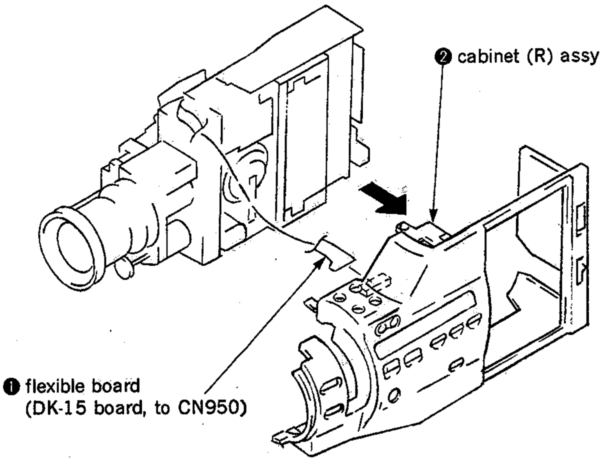
2-2. REMOVAL OF VTR PANEL (L) ASSY


❷ screws (K2×4)
❸ shoe, accessory
❹ screws (M2×4)
❶ Stand the EVF assy in the direction of arrow Ⓐ .
❻ While removeing the click, and remove the panel (L) assy, VTR.
Ⓐ
❺ screws (M2×4)
click

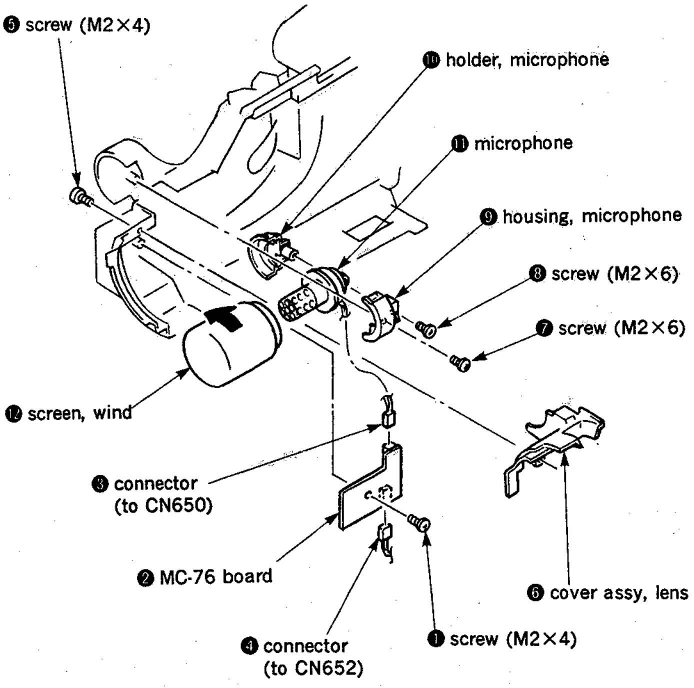
2-4. REMOVAL OF CABINET (L) ASSY


❿ connector (VA-67 board, to CN401)
❺ While removing the click, remove the cabinet (L) assy.
❾ connector (VA-67 board, to CN601)
❹ screw (M2×4)
❼ connector (SS-136 board, to CN503)
❸ screw (M2×4)
❽ connector (VC-94 board, to CN306)
❷ screw (M2×4)
❶ screws (M2×4)
❻ connector (LI-39 board, to CN961)

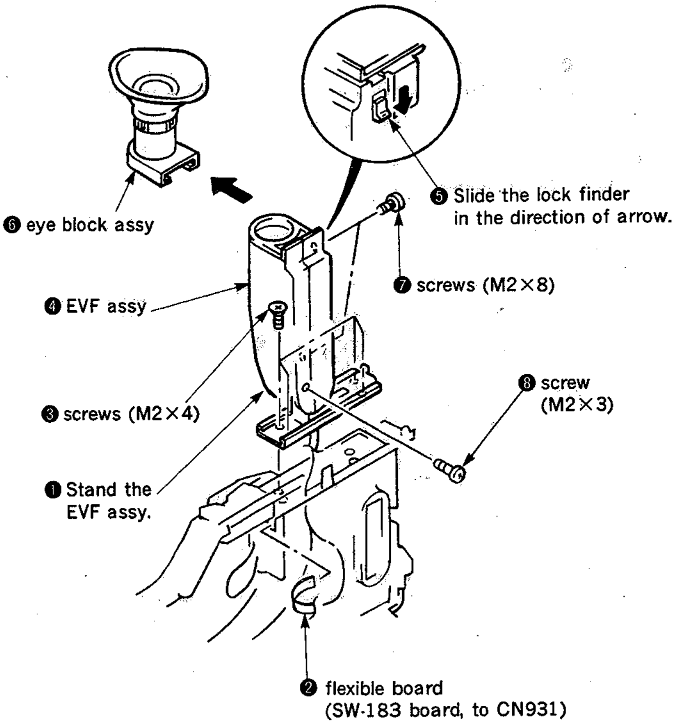
2-5. REMOVAL OF CABINET (R) ASSY

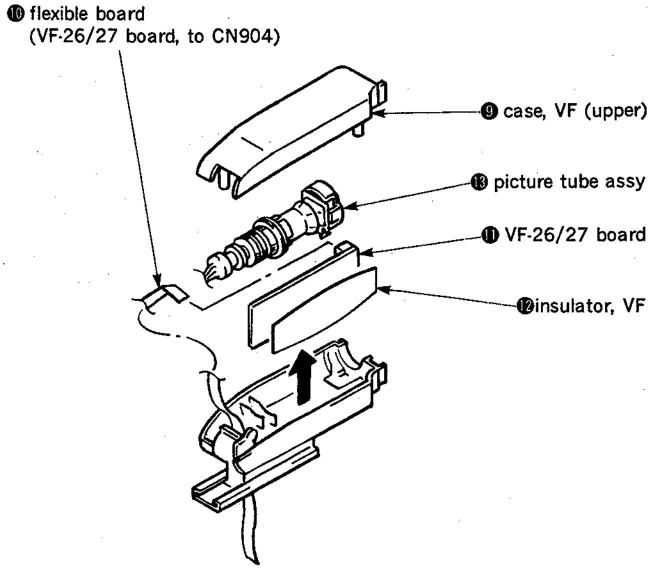

❷ cabinet (R) assy
❶ flexible board (DK-15 board, to CN950)

2-6. REMOVAL OF MICROPHONE (MC-76 BOARD)

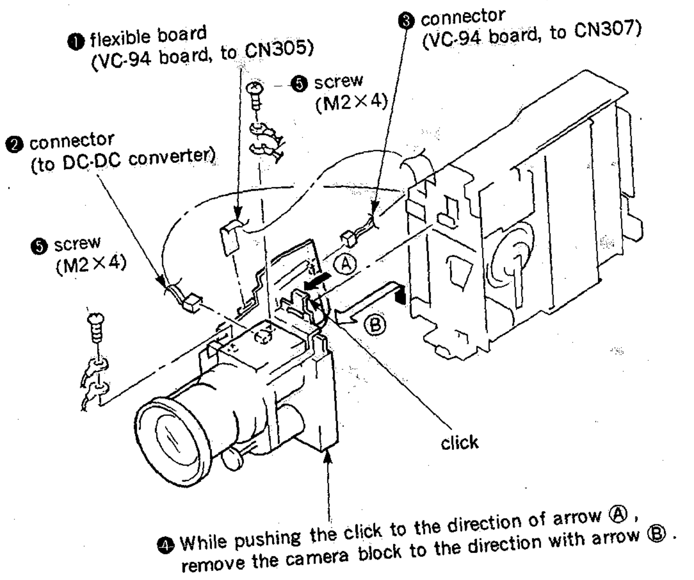

❺ screw (M2×4)
❿ holder, microphone
⓫ microphone
❾ housing, microphone
❽ screw (M2×6)
❼ screw (M2×6)
⓬ screen, wind
❸ connector (to CN650)
❷ MC-76 board
❻ cover assy, lens
❹ connector (to CN652)
❶ screw (M2×4)

2-7. REMOVAL OF EVF ASSY

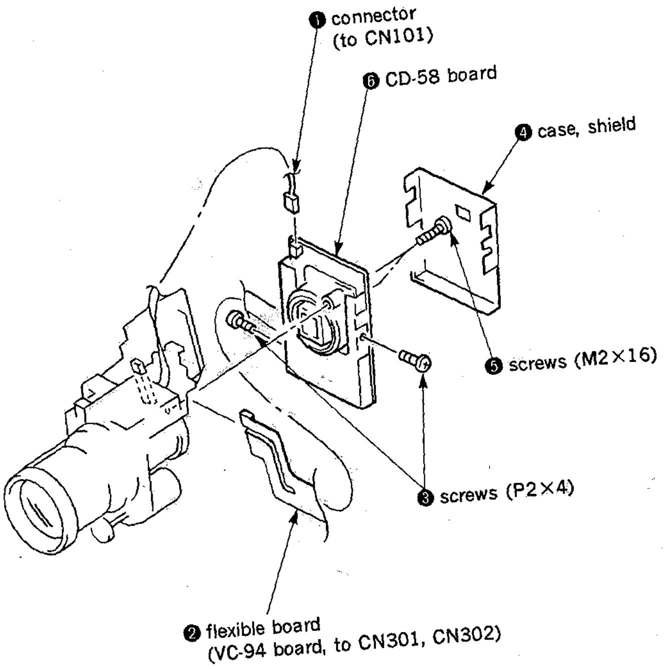

❻ eye block assy
❺ Slide the lock finder in the direction of arrow.
❼ screws (M2×8)
❹ EVF assy
❽ screw (M2×3)
❸ screws (M2×4)
❶ Stand the EVF assy.
❷ flexible board (SW-183 board, to CN931)

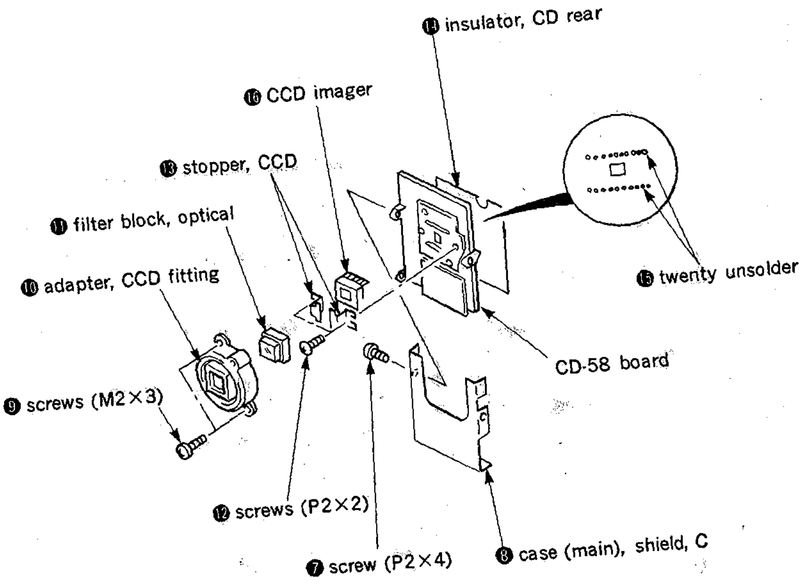

❿ flexible board (VF-26/27 board, to CN904)
❾ case, VF (upper)
⓭ picture tube assy
⓫ VF-26/27 board
⓬ insulator, VF

2-8. REMOVAL OF CAMERA BLOCK

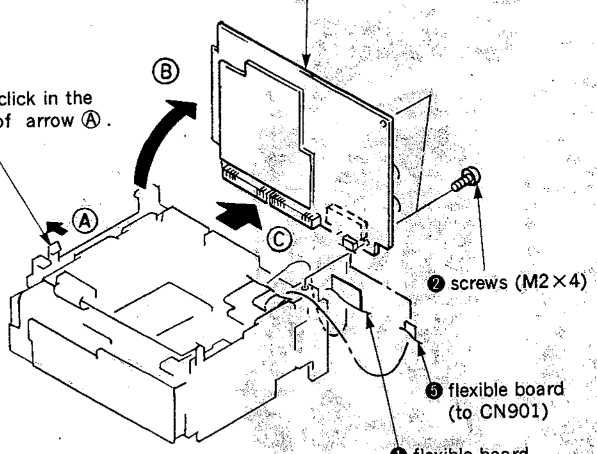

① flexible board
(VC-94 board, to CN305)
③ connector
(VC-94 board, to CN307)
⑤ screw
(M2×4)
② connector
(to DC-DC converter)
⑤ screw
(M2×4)
Ⓐ
Ⓑ
click
④ While pushing the click to the direction of arrow Ⓐ, remove the camera block to the direction with arrow Ⓑ.

2-9. REMOVAL OF CCD IMAGER (CD-58 BOARD)


① connector
(to CN101)
⑥ CD-58 board
④ case, shield
⑤ screws (M2×16)
③ screws (P2×4)
② flexible board
(VC-94 board, to CN301, CN302)


⑭ insulator, CD rear
⑯ CCD imager
⑬ stopper, CCD
⑪ filter block, optical
⑩ adapter, CCD fitting
⑮ twenty unsolder
CD-58 board
⑨ screws (M2×3)
⑫ screws (P2×2)
⑦ screw (P2×4)
⑧ case (main), shield, C

2-10. REMOVAL OF VA-67 BOARD



❶ flexible board (to CN508)

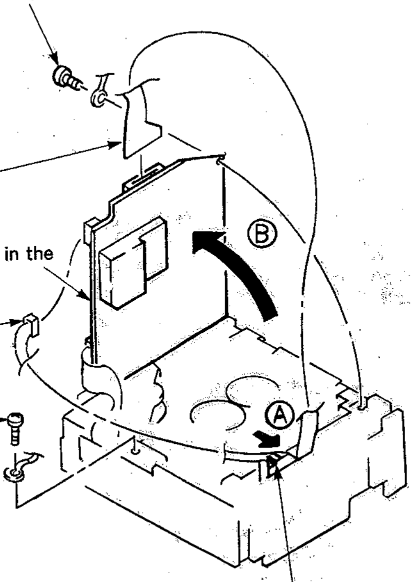
❷ screws (M2×4)

❸ Push the click in the direction of arrow Ⓐ.

❹ Open the VA-67 board in the direction of arrow Ⓑ, and remove in the direction of arrow Ⓐ.

❺ flexible board (to CN901)

2-11. REMOVAL OF SS-136 BOARD



❶ flexible board (to CN509)

❷ screw (M2×4)

❸ screw (M2×4)

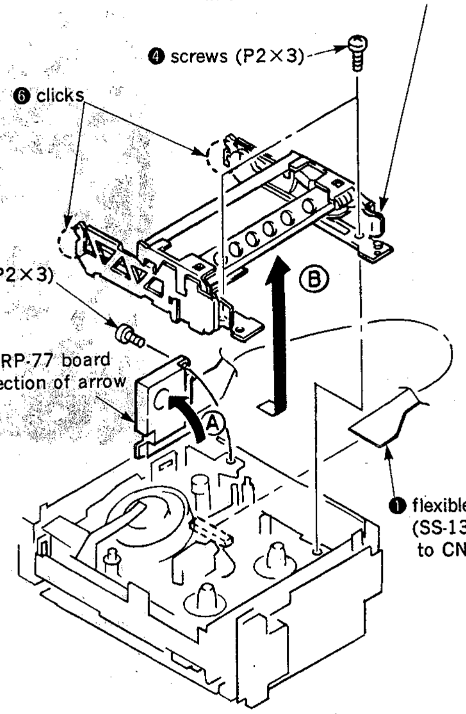
❹ connector (to CN505)

❺ Push the click in the direction of arrow Ⓐ.

❻ Open the SS-136 board in the direction of arrow Ⓐ.

2-12. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

Note: When mounting, fit the clicks ❻ into completely, then clamp two screws ❹.



❶ flexible board (SS-136 board, to CN501)

❷ screw (P2×3)

❸ Open the RP-77 board in the direction of arrow Ⓐ.

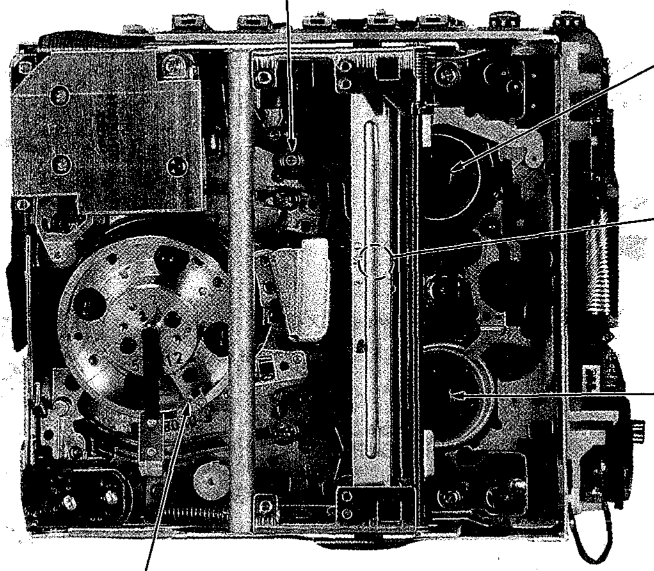
❹ screws (P2×3)

❺ Remove the cassette compartment assy in the direction of arrow Ⓑ.

❻ clicks

2-13. INTERNAL VIEWS

— Upper —



ARM block assy, pinch
A-7040-219-A

Table assy, reel, take-up
X-3728-855-1

Tape top/Tape end LED
(GL-452S)
8-719-940-81

Table assy, reel, supply
X-3728-851-1

Drum

Drum ASSY (DGU-57A-R)	A-7048-357-A
Drum upper (DGR-57-R)	A-7049-307-A

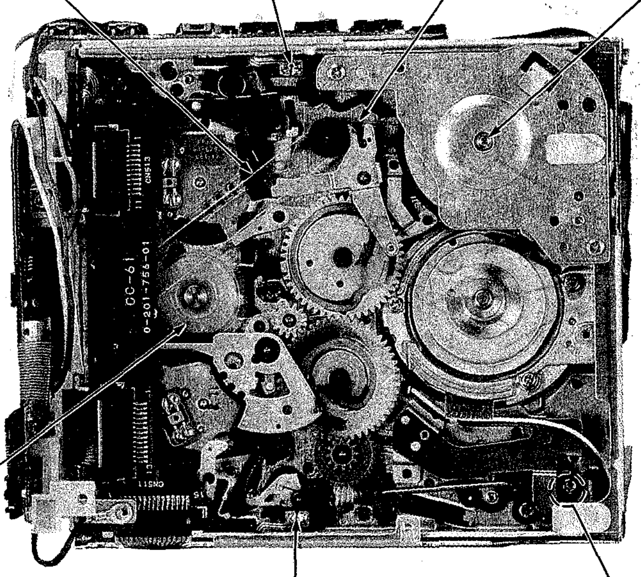
— Lower —

Belt (L), timing
3-741-197-01

Tape top sensor (EE-TP109)
8-729-906-48

Belt (S), timing
3-728-866-11

Motor, capstan (M902)
8-835-331-01



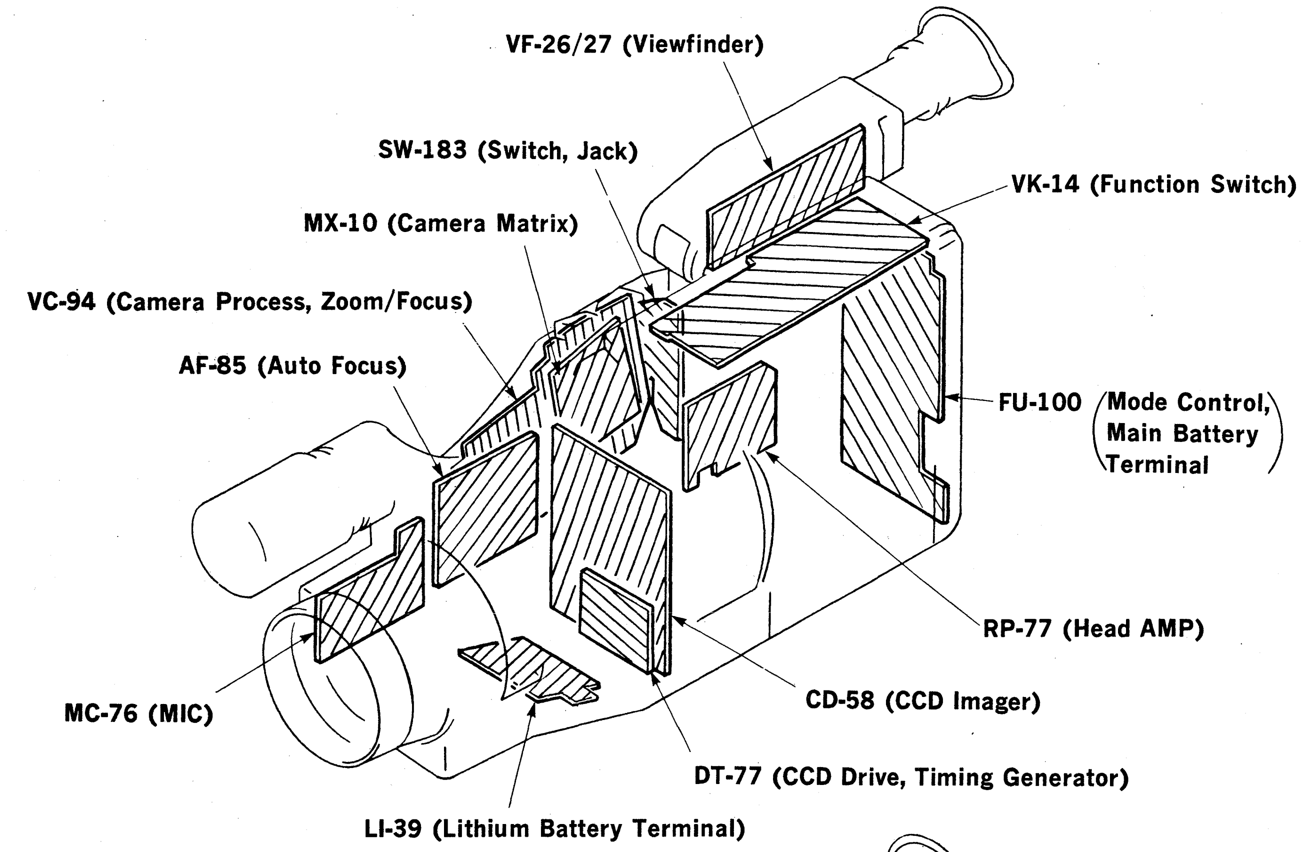
Gear assy, RK
X-3728-866-1

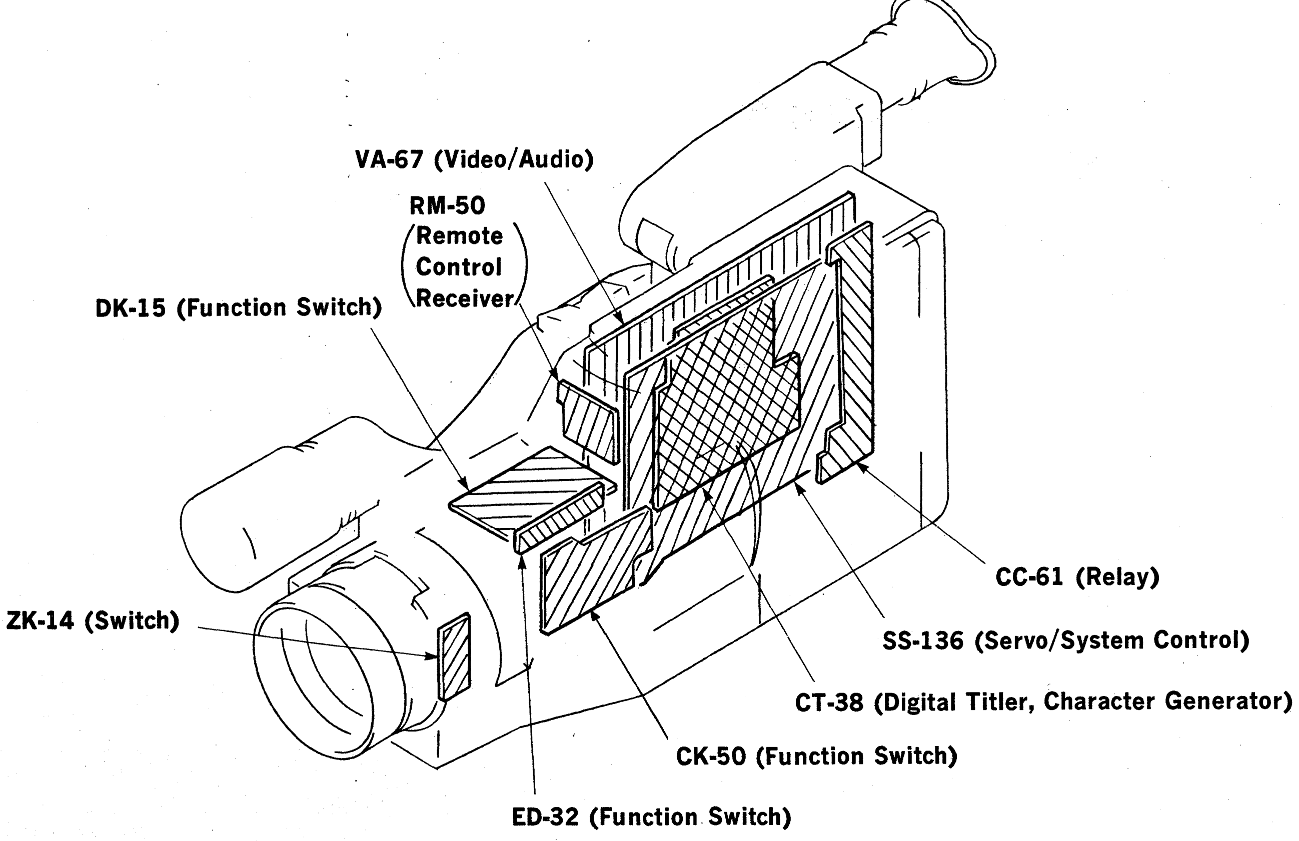
Tape end sensor
(EE-TP109)
8-729-906-48

Motor assy, loading (M903)
A-7040-208-A

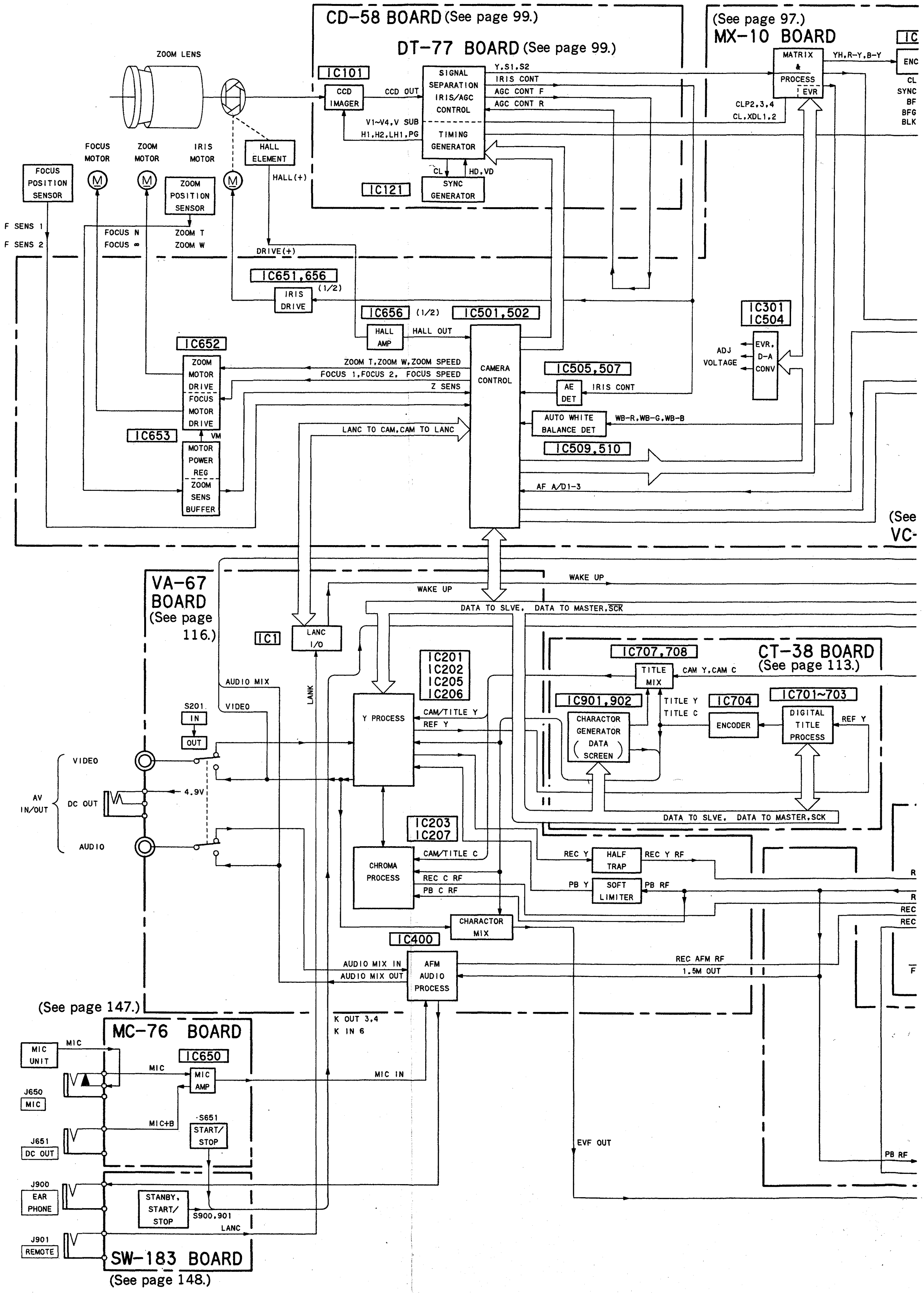
SECTION 3
DIAGRAMS

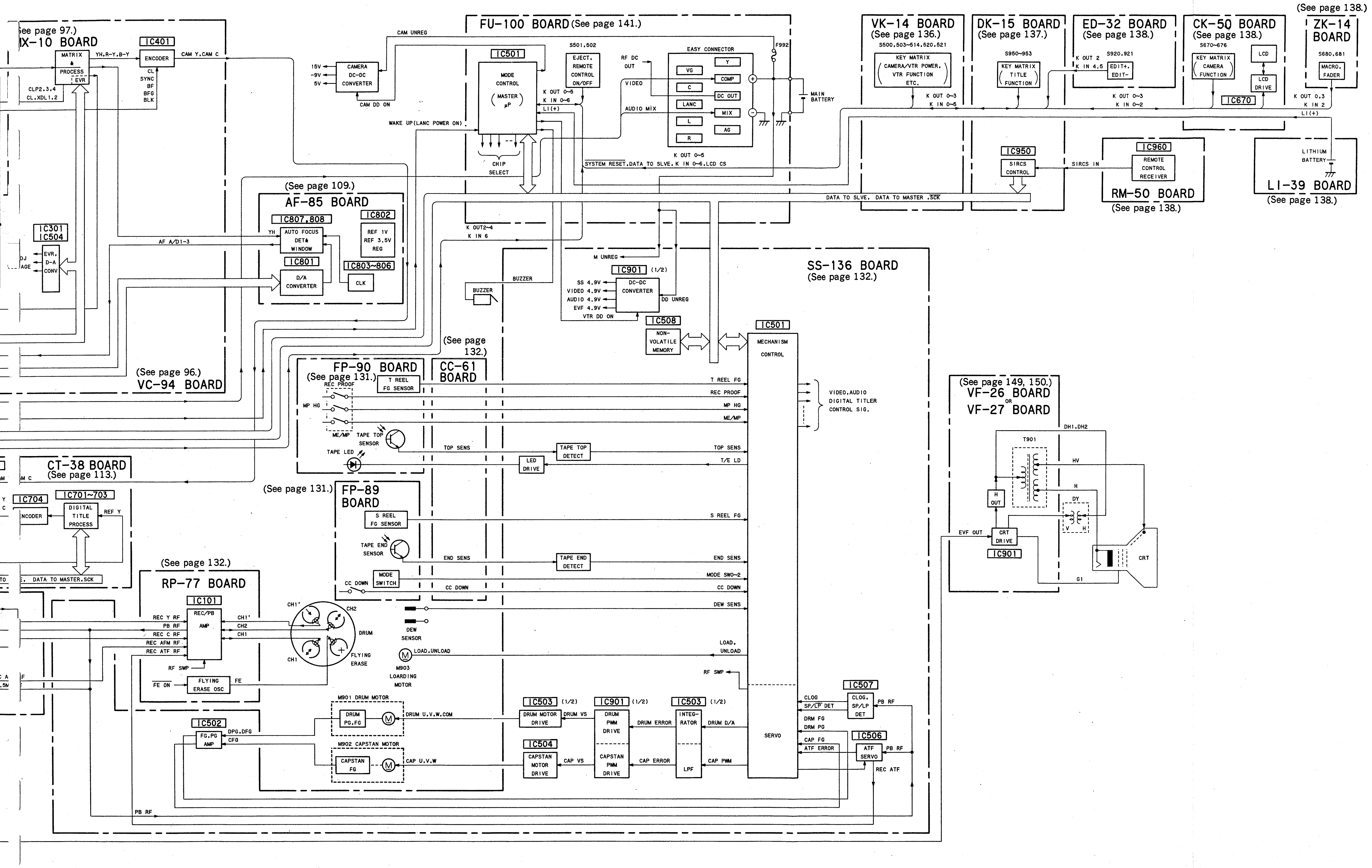
3-1. CIRCUIT BOARDS LOCATION


VF-26/27 (Viewfinder)
SW-183 (Switch, Jack)
VK-14 (Function Switch)
MX-10 (Camera Matrix)
VC-94 (Camera Process, Zoom/Focus)
AF-85 (Auto Focus)
FU-100 (Mode Control, Main Battery Terminal)
RP-77 (Head AMP)
CD-58 (CCD Imager)
MC-76 (MIC)
DT-77 (CCD Drive, Timing Generator)
LI-39 (Lithium Battery Terminal)

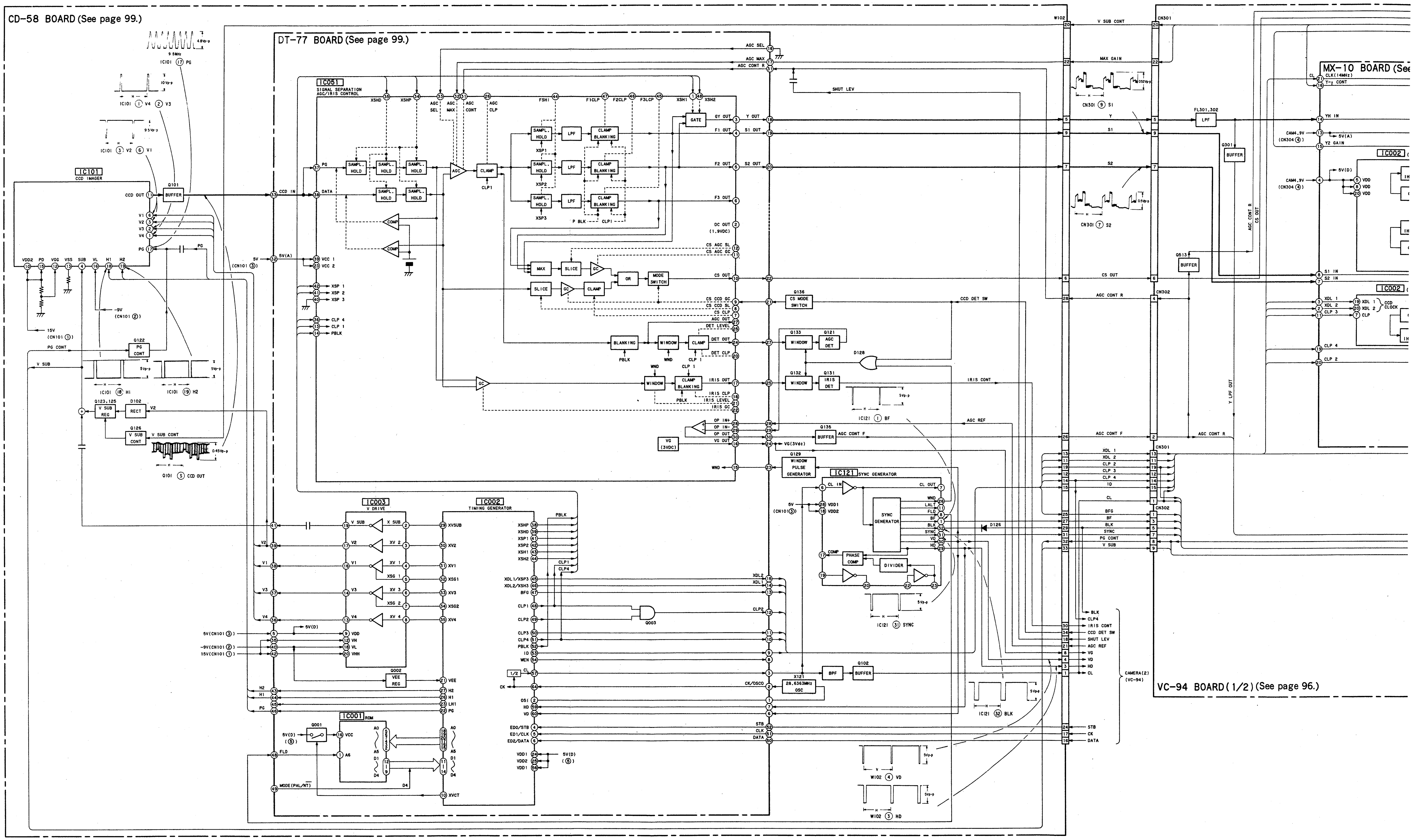

VA-67 (Video/Audio)
RM-50 (Remote Control Receiver)
DK-15 (Function Switch)
CC-61 (Relay)
ZK-14 (Switch)
SS-136 (Servo/System Control)
CT-38 (Digital Titler, Character Generator)
CK-50 (Function Switch)
ED-32 (Function Switch)

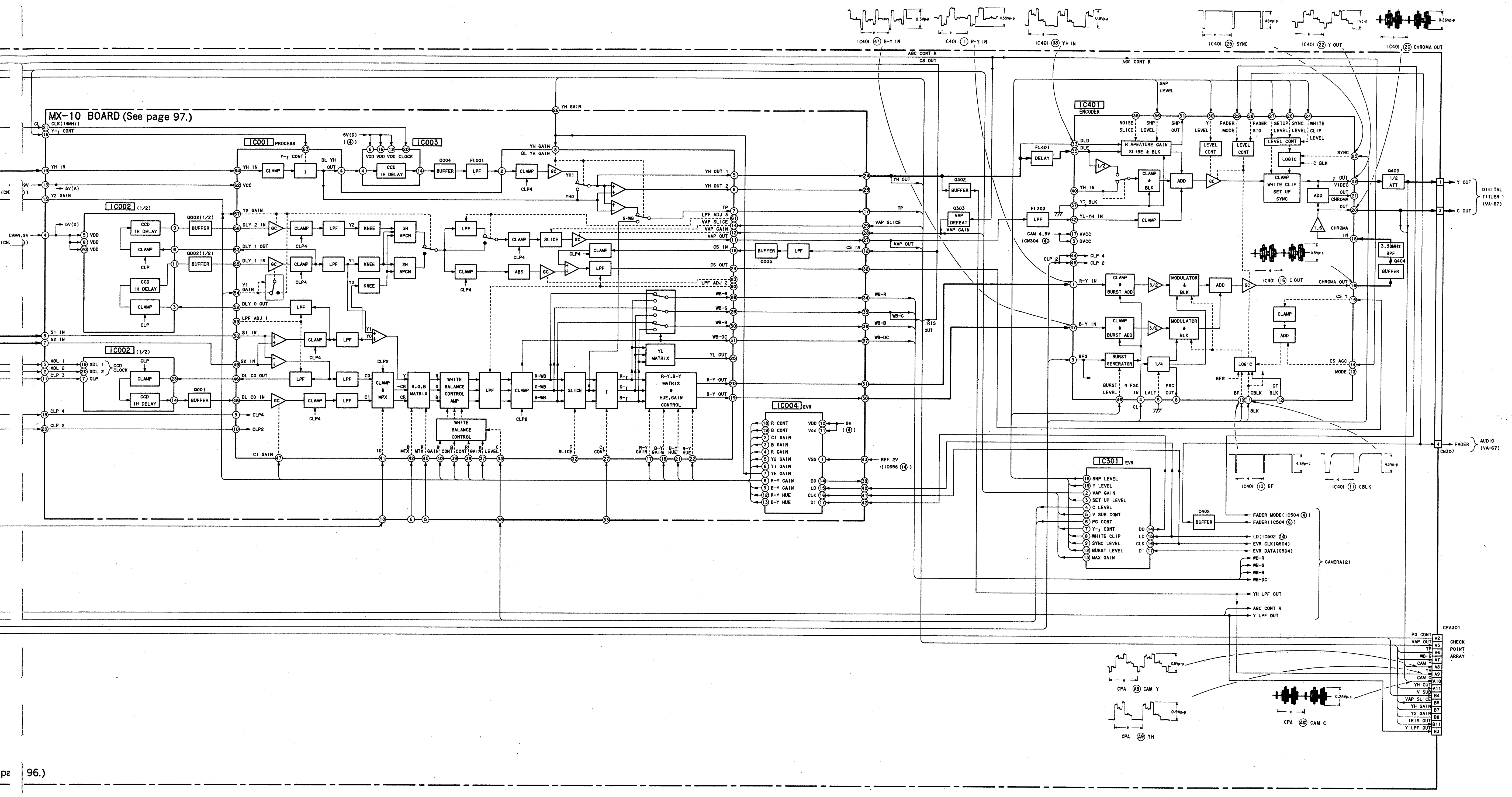
3-2. OVERALL BLOCK DIAGRAM


CD-58 BOARD (See page 99.)
DT-77 BOARD (See page 99.)
(See page 97.)
MX-10 BOARD
ZOOM LENS
IC101
CCD IMAGER
CCD OUT
SIGNAL SEPARATION IRIS/AGC CONTROL
Y,S1,S2
IRIS CONT
AGC CONT F
AGC CONT R
V1~V4,V SUB
H1,H2,LH1,PG
TIMING GENERATOR
CL
HD,VD
IC121
SYNC GENERATOR
MATRIX & PROCESS
EVR
YH,R-Y,B-Y
ENC
CLP2,3,4
CL,XDL1,2
FOCUS MOTOR
ZOOM MOTOR
IRIS MOTOR
HALL ELEMENT
HALL(+)
FOCUS POSITION SENSOR
ZOOM POSITION SENSOR
F SENS 1
F SENS 2
FOCUS N
FOCUS ⇐
ZOOM T
ZOOM W
DRIVE(+)
IC651,656 (1/2)
IRIS DRIVE
IC656 (1/2)
HALL AMP
HALL OUT
IC501,502
IC652
ZOOM MOTOR DRIVE
FOCUS MOTOR DRIVE
IC653
VM
MOTOR POWER REG
ZOOM SENS BUFFER
ZOOM T,ZOOM W,ZOOM SPEED
FOCUS 1,FOCUS 2, FOCUS SPEED
Z SENS
CAMERA CONTROL
LANC TO CAM,CAM TO LANC
IC505,507
AE DET
IRIS CONT
AUTO WHITE BALANCE DET
WB-R,WB-G,WB-B
IC509,510
AF A/D1-3
IC301
IC504
ADJ VOLTAGE
EVR, D-A CONV
(See
VC-
VA-67 BOARD (See page 116.)
WAKE UP
DATA TO SLVE, DATA TO MASTER,SCK
IC1
LANC I/O
LANK
AUDIO MIX
VIDEO
S201
IN
OUT
AV IN/OUT
VIDEO
DC OUT
AUDIO
4.9V
IC201
IC202
IC205
IC206
Y PROCESS
CAM/TITLE Y
REF Y
IC203
IC207
CHROMA PROCESS
CAM/TITLE C
REC C RF
PB C RF
CHARACTOR MIX
IC400
AUDIO MIX IN
AUDIO MIX OUT
AFM AUDIO PROCESS
K OUT 3,4
K IN 6
MIC IN
IC707,708
TITLE MIX
CAM Y,CAM C
CT-38 BOARD (See page 113.)
IC901,902
CHARACTOR GENERATOR (DATA SCREEN)
TITLE Y
TITLE C
IC704
ENCODER
IC701~703
DIGITAL TITLE PROCESS
REF Y
DATA TO SLVE, DATA TO MASTER,SCK
REC Y
HALF TRAP
REC Y RF
PB Y
SOFT LIMITER
PB RF
REC AFM RF
1.5M OUT
EVF OUT
(See page 147.)
MC-76 BOARD
IC650
MIC UNIT
MIC
MIC AMP
J650 MIC
MIC+B
S651 START/STOP
J651 DC OUT
J900 EAR PHONE
STANBY, START/STOP
S900,901
LANC
J901 REMOTE
SW-183 BOARD (See page 148.)


(See page 97.)
MX-10 BOARD
MATRIX & PROCESS
EVR
YH,R-Y,B-Y
IC401
ENCODER
CAM Y,CAM C
CL
SYNC
BF
BFG
BLK
CLP2,3,4
CL,XDL1,2
IC301
IC504
EVR, D-A CONV
DJ
AGE
15V
-9V
5V
CAMERA DC-DC CONVERTER
CAM UNREG
CAM DD ON
WAKE UP(LANC POWER ON)
FU-100 BOARD (See page 141.)
IC501
MODE CONTROL (MASTER μP)
CHIP SELECT
S501,502
EJECT, REMOTE CONTROL ON/OFF
K OUT 0~5
K IN 0~6
LI(+)
RF DC OUT
VIDEO
AUDIO MIX
EASY CONNECTOR
Y
VG
COMP
C
DC OUT
LANC
MIX
L
AG
R
F992
MAIN BATTERY
K OUT 0~5
SYSTEM RESET,DATA TO SLVE,K IN 0~6,LCD CS
K OUT2~4
K IN 6
(See page 109.)
AF-85 BOARD
IC807,808
YH
AUTO FOCUS DET& WINDOW
IC802
REF 1V REF 3.5V REG
AF A/D1-3
IC801
D/A CONVERTER
IC803~806
CLK
(See page 96.)
VC-94 BOARD
BUZZER
BUZZER
M UNREG
IC901 (1/2)
DC-DC CONVERTER
SS 4.9V
VIDEO 4.9V
AUDIO 4.9V
EVF 4.9V
VTR DD ON
DD UNREG
IC508
NON-VOLATILE MEMORY
SS-136 BOARD
(See page 132.)
IC501
MECHANISM CONTROL
SERVO
VK-14 BOARD
(See page 136.)
S500,503~514,520,521
KEY MATRIX (CAMERA/VTR POWER, VTR FUNCTION ETC.)
K OUT 0~3
K IN 0~5
DK-15 BOARD
(See page 137.)
S950~953
KEY MATRIX (TITLE FUNCTION)
ED-32 BOARD
(See page 138.)
K OUT 2
K IN 4.5
S920,921
EDIT+, EDIT-
K OUT 0~3
K IN 0~2
CK-50 BOARD
(See page 138.)
S670~676
KEY MATRIX (CAMERA FUNCTION)
LCD
LCD DRIVE
IC670
(See page 138.)
ZK-14 BOARD
S680,681
MACRO, FADER
K OUT 0,3
K IN 2
LI(+)
IC950
SIRCS CONTROL
SIRCS IN
IC960
REMOTE CONTROL RECEIVER
RM-50 BOARD
(See page 138.)
LITHIUM BATTERY
LI-39 BOARD
(See page 138.)
DATA TO SLVE, DATA TO MASTER ,SCK
(See page 132.)
CC-61 BOARD
FP-90 BOARD
(See page 131.)
T REEL FG SENSOR
REC PROOF
MP HG
ME/MP
TAPE TOP SENSOR
TAPE LED
T REEL FG
REC PROOF
MP HG
ME/MP
VIDEO,AUDIO DIGITAL TITLER CONTROL SIG.
TOP SENS
TAPE TOP DETECT
TOP SENS
LED DRIVE
T/E LD
CT-38 BOARD
(See page 113.)
M C
IC704
ENCODER
IC701~703
DIGITAL TITLE PROCESS
REF Y
DATA TO MASTER.SCK
(See page 131.)
FP-89 BOARD
S REEL FG SENSOR
S REEL FG
TAPE END SENSOR
END SENS
TAPE END DETECT
END SENS
MODE SWITCH
MODE SWO~2
CC DOWN
CC DOWN
CC DOWN
DEW SENS
DEW SENSOR
(See page 132.)
RP-77 BOARD
IC101
REC/PB AMP
REC Y RF
PB RF
REC C RF
REC AFM RF
REC ATF RF
CH1'
CH2
CH1
RF SWP
FE ON
FLYING ERASE OSC
FE
CH1'
CH2
CH1
DRUM
FLYING ERASE
M903 LOARDING MOTOR
LOAD,UNLOAD
LOAD, UNLOAD
RF SWP
M901 DRUM MOTOR
DRUM PG,FG
DRUM U.V.W.COM
M902 CAPSTAN MOTOR
CAPSTAN FG
CAP U.V.W
IC502
FG,PG AMP
DPG,DFG
CFG
IC503 (1/2)
DRUM MOTOR DRIVE
DRUM VS
IC504
CAPSTAN MOTOR DRIVE
CAP VS
IC901 (1/2)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
DRUM ERROR
CAP ERROR
IC503 (1/2)
INTEG-RATOR
LPF
DRUM D/A
CAP PWM
CLOG
SP/LP DET
DRM FG
DRM PG
CAP FG
ATF ERROR
IC507
CLOG, SP/LP DET
PB RF
IC506
ATF SERVO
PB RF
REC ATF
PB RF
(See page 149, 150.)
VF-26 BOARD
OR
VF-27 BOARD
DH1,DH2
T901
HV
H
H OUT
DY
V
H
EVF OUT
CRT DRIVE
IC901
CRT
G1

3-3. CAMERA (1) BLOCK DIAGRAM


CD-58 BOARD (See page 99.)
DT-77 BOARD (See page 99.)
MX-10 BOARD (See
VC-94 BOARD (1/2) (See page 96.)
IC101 CCD IMAGER
Q101 BUFFER
IC051 SIGNAL SEPARATION AGC/IRIS CONTROL
SAMPL. HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
GATE
COMP
MAX
SLICE
GC
OR
MODE SWITCH
BLANKING
WINDOW
CLAMP BLANKING
VG (3VDC)
Q122 PG CONT
Q123,125 V SUB REG
D102 RECT
Q126 V SUB CONT
IC003 V DRIVE
IC002 TIMING GENERATOR
Q002 VEE REG
Q003
IC001 ROM
Q001
IC121 SYNC GENERATOR
SYNC GENERATOR
PHASE COMP
DIVIDER
X121 28.6363MHz OSC
BPF
Q102 BUFFER
Q136 CS MODE SWITCH
Q133 WINDOW
Q121 AGC DET
Q132 WINDOW
Q131 IRIS DET
D128
Q135 BUFFER
Q129 WINDOW PULSE GENERATOR
D126
FL301,302 LPF
Q301 BUFFER
Q513 BUFFER
IC002
CCD CLOCK
W102
CN301
CN302
V SUB CONT
MAX GAIN
Y
S1
S2
CS OUT
AGC CONT R
AGC CONT F
SHUT LEV
CCD DET SW
IRIS CONT
AGC REF
XDL 1
XDL 2
CLP 2
CLP 3
CLP 4
ID
CL
BFG
BF
BLK
SYNC
PG CONT
V SUB
BLK
CLP4
IRIS CONT
CCD DET SW
SHUT LEV
AGC REF
VG
VD
HD
CL
STB
CK
DATA
CAMERA(2) (VC-94)
IC101 ⑰ PG
IC101 ① V4 ② V3
IC101 ③ V2 ⑥ V1
IC101 ⑱ H1
IC101 ⑲ H2
Q101 ⑤ CCD OUT
CN301 ⑨ S1
CN301 ⑦ S2
IC121 ① BF
IC121 ③① SYNC
IC121 ③② BLK
W102 ④ VD
W102 ③ HD
9.5MHz
4.8Vp-p
10Vp-p
9.5Vp-p
5Vp-p
0.45Vp-p
0.52Vp-p
0.5Vp-p
5Vp-p
YH IN
Y2 GAIN
S1 IN
S2 IN
Y LPF OUT
AGC CONT R
CS OUT
CLK(14MHz)
Y-Y CONT
CAM4.9V (CN304 ④)
5V(A)
5V(D)
VDD
15V (CN101 ③)
-9V (CN101 ②)
5V(CN101 ③)
-9V(CN101 ②)
15V(CN101 ①)
MODE(PAL/NT)
FLD
XVCT
28.6363MHz OSC
CK/OSCO



MX-10 BOARD (See page 97.)
IC001 PROCESS
IC002 (1/2)
IC003
IC004 EVR
IC301 EVR
IC401 ENCODER
CCD 1H DELAY
CLAMP
BUFFER
LPF
KNEE
3H APCN
2H APCN
SLICE
ABS
R.G.B MATRIX
WHITE BALANCE CONTROL AMP
R-Y, B-Y MATRIX & HUE, GAIN CONTROL
YL MATRIX
CLAMP & MPX
H APEATURE GAIN SLISE & BLK
CLAMP & BURST ADD
MODULATOR & BLK
BURST GENERATOR
LOGIC
LEVEL CONT
CLAMP WHITE CLIP SET UP SYNC
VAP DEFEAT
FL401 DELAY
FL303 LPF
FL001
Q004
Q002(1/2)
Q001
Q003
Q302
Q303
Q402
Q403 1/2 ATT
Q404
3.58MHz BPF
YH GAIN
YH IN
Y2 GAIN
DLY 2 IN
DLY 1 OUT
DLY 1 IN
DLY 0 OUT
S1 IN
S2 IN
XDL 1
XDL 2
CLP 3
DL CO OUT
DL CO IN
CLP 4
CLP 2
CI GAIN
YH OUT 1
YH OUT 2
TP
LPF ADJ 3
VAP SLICE
VAP GAIN
VAP OUT
CS IN
CS OUT
LPF ADJ 2
WB-R
WB-G
WB-B
WB-DC
YL OUT
R-Y OUT
B-Y OUT
REF 2V (IC656 ⑭)
AGC CONT R
IRIS OUT
Y OUT
C OUT
DIGITAL TITLER (VA-67)
AUDIO FADER (VA-67)
CN307
CPA301 CHECK POINT ARRAY
FADER MODE (IC504 ⑤)
FADER (IC504 ⑥)
LD (IC502 ⑲)
EVR CLK (Q504)
EVR DATA (Q504)
CAMERA(2)
YH LPF OUT
AGC CONT R
Y LPF OUT
IC401 ㊼ B-Y IN
IC401 ① R-Y IN
IC401 ㉝ YH IN
IC401 ㉕ SYNC
IC401 ㉒ Y OUT
IC401 ⑳ CHROMA OUT
IC401 ⑯ C OUT
IC401 ⑩ BF
IC401 ⑪ CBLK
CPA Ⓐ8 CAM Y
CPA Ⓐ9 YH
CPA Ⓐ10 CAM C
(See pa
96.)

3-4. CAMERA SYSTEM CONTROL VC-94 BOARD IC501 (MC68HC11E9)

〔Description〕

MC68HC11E9 is a 8-bit one-chip micro controller with a built-in nonvolatile memory (EEPROM). All the camera system, which has been composed by mere than one, can be controlled by only this micro controller. In addition, protocol master control of the LANC communication can be performed.

1. Function

1) EVR Control
2) AWB Control
3) AE Control
4) AF Control
5) LANC communication protocol control

2. Pin Description

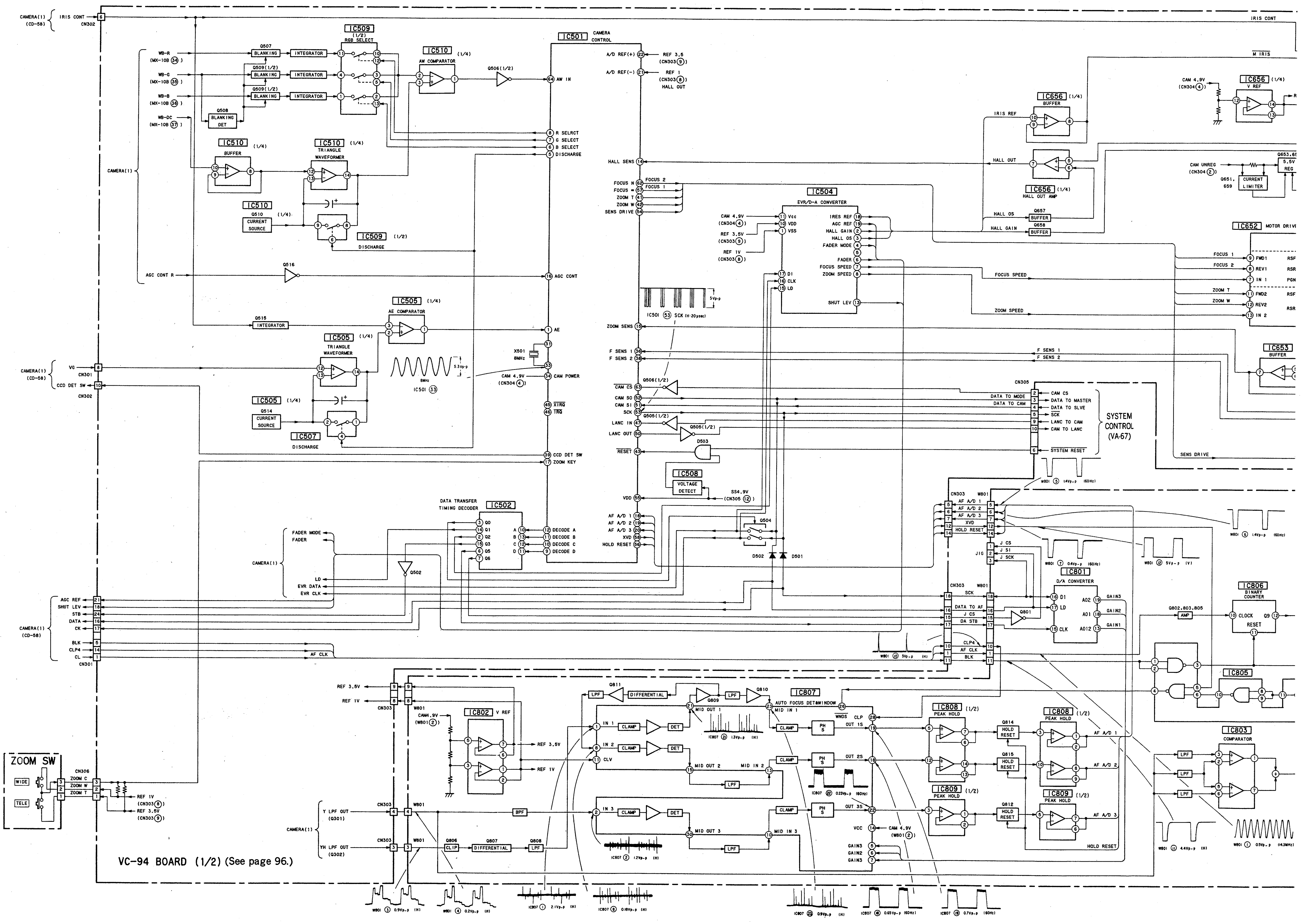
PIN No.	PIN Name	I/O	Function
1	AE	I	AE Integration-type A/D converter comparator input
2	NC	—	——
3	NC	—	——
4	NC	—	——
5	DISCHG	O	AWB. AE Integration-type A/D reset pulse
6	B SELECT	O	AWB Instrumentation line select pulse (blue)
7	G SELECT	O	AWB Instrumentation line select pulse (green)
8	R SELECT	O	AWB Instrumentation line select pulse (red)
9	DECODE D	O	Decode 4 to 10 and expand port with outside IC (4208)
10	DECODE C	O	Decode 4 to 10 and expand port with outside IC (4208)
11	DECODE B	O	Decode 4 to 10 and expand port with outside IC (4208)
12	DECODE A	O	Decode 4 to 10 and expand port with outside IC (4208)
13	NC	—	——
14	HALL SENS	I	Hall element voltage input (Analog input)
15	ZOOM SENS	I	Zoom position detection voltage input (Analog input)
16	AGC CONT	I	AGC voltage input (Analog input)
17	ZOOM KEY	I	Zoom switch voltage input (Analog input)
18	AF A/D 1	I	AF peak hold Data1 input (Analog input)
19	AF A/D 2	I	AF peak hold Data2 input (Analog input)
20	AF A/D 3	I	AF peak hold Data3 input (Analog input)
21	A/D REF(−)	—	Built-in A/D converter the minimum standard voltage (Analog input)
22	A/D REF(+)	—	Built-in A/D converter the minimum standard voltage (Analog input)
23	V_{SS}	—	GND
24	V_{SS}	—	GND
25	MODE B	I	Pull up to SS4.9V
26	NC	—	——
27	MODA	I	Pull down to GND
28	STR A	—	NC Not used
29	E	—	NC Not used
30	STR B	—	NC Not used

3-5. C

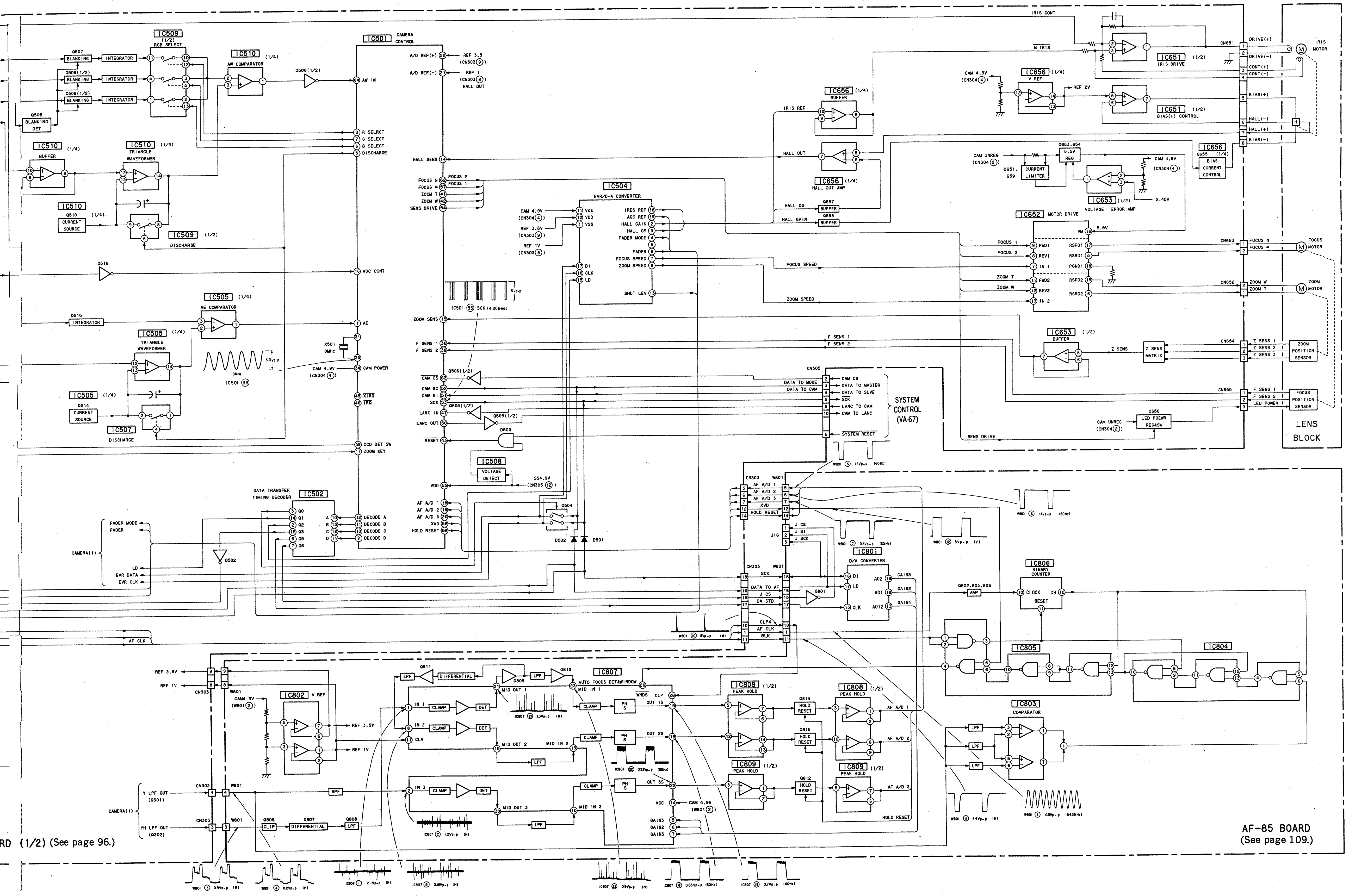
PIN No.	PIN Name	I/O	Function
31	EXTAL	O	Built-in inverter output for oscillating element
32	NC	—	——
33	XTAL	I	Built-in inverter input for oscillating element
34	CAM POWER	I	Camera power source rise supervision
35	NC	—	——
36	F SENS1	I	Focus sensor 1 voltage entrance (Analog input)
37	PC2	I	Pull up to SS4.9V
38	F SENS2	I	Focus sensor 2 voltage entrance (Analog input)
39	CCD DET SW	O	CCD DET switch select
40	$\overline{\text{MAN IRIS}}$	O	NC
41	ZOOM T	O	Zoom motor T-direction rotating designation
42	ZOOM W	O	Zoom motor W-direction rotating designation
43	$\overline{\text{RESET}}$	I	Reset
44	NC	—	——
45	$\overline{\text{XIRQ}}$	I	Pull up to SS4.9V
46	$\overline{\text{IRQ}}$	I	Pull up to SS4.9V
47	LANC IN	I	LANC input
48	NC	—	——
49	V_{SS}	—	GND
50	LANC OUT	O	LANC output
51	CAM SI	I	Serial data input
52	CAM SO	O	Serial data output
53	SCK	O	Serial clock
54	SENS DRIVE	O	AF sensor Luminous pulse output
55	V_{DD}	—	SS4.9V
56	HOLD RESET	O	V Peak Hold reset pulse output
57	FOCUS ∞	O	Focus motor ∞-direction rotating designation
58	XVD	O	V frame for AF distance measurement
59	$\overline{\text{MAN GAIN}}$	O	NC
60	NC	—	——
61	NC	—	——
62	$\overline{\text{FOCUS N}}$	O	Focus motor N-direction rotating designation
63	$\overline{\text{CAMCS}}$	I	Camera chip select input
64	$\overline{\text{AW IN}}$	I	AWB Integration-type A/D converter comparator input

3-5. CAMERA (2) BLOCK DIAGRAM

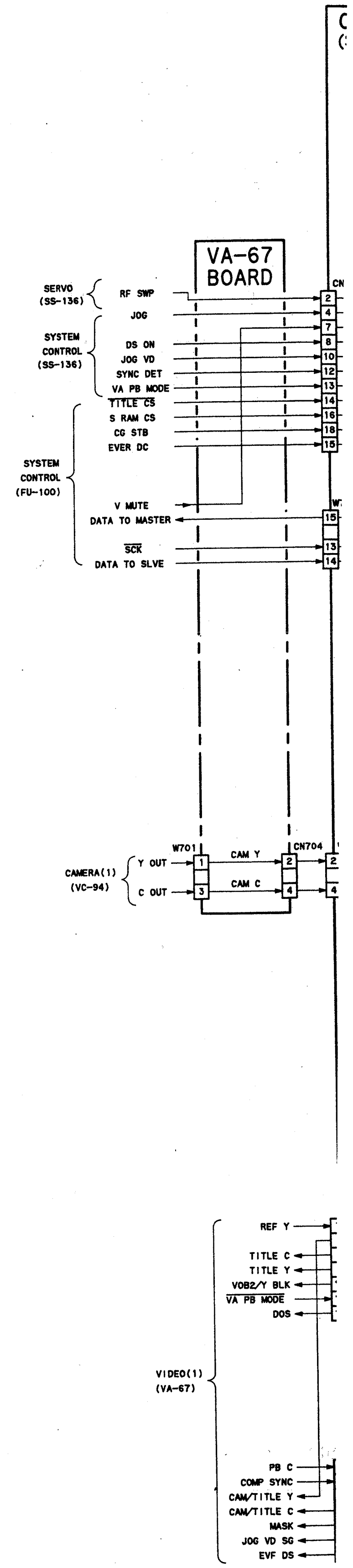
ut



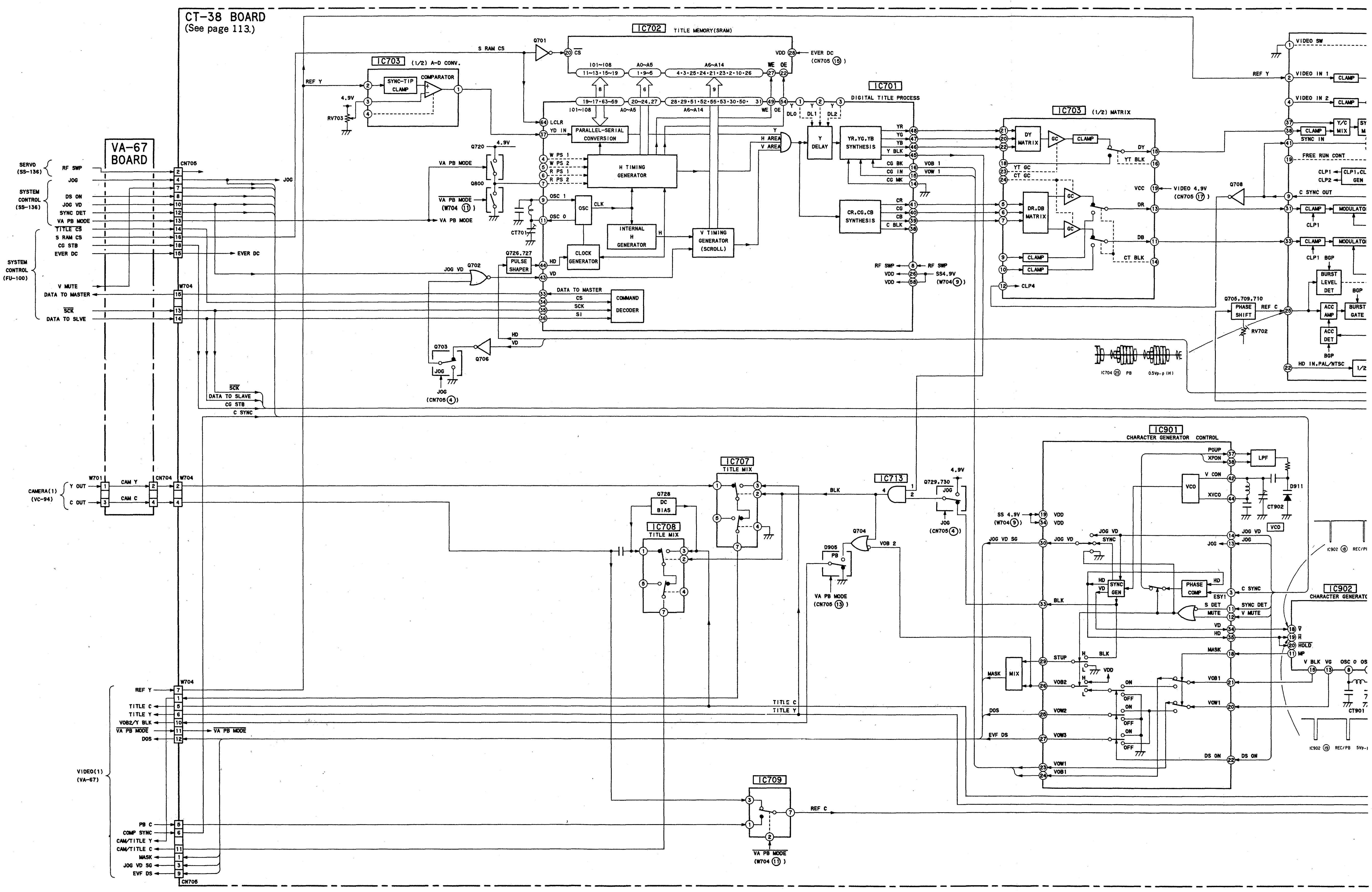
IC509 (1/2) RGB SELECT
IC501 CAMERA CONTROL
IC510 (1/4) AW COMPARATOR
Q506(1/2)
Q507 BLANKING
Q509(1/2) BLANKING
Q508 BLANKING DET
INTEGRATOR
WB-R (MX-108 34)
WB-G (MX-108 35)
WB-B (MX-108 36)
WB-DC (MX-108 37)
CAMERA(1) (CD-58)
IRIS CONT
CN302
IC510 (1/4) BUFFER
IC510 (1/4) TRIANGLE WAVEFORMER
IC510 Q510 CURRENT SOURCE
IC509 (1/2) DISCHARGE
AW IN
R SELECT
G SELECT
B SELECT
DISCHARGE
A/D REF(+)
A/D REF(−)
REF 3.5 (CN303 9)
REF 1 (CN303 8)
HALL OUT
HALL SENS
FOCUS N
FOCUS =
ZOOM T
ZOOM W
SENS DRIVE
FOCUS 2
FOCUS 1
IC504 EVR/D-A CONVERTER
CAM 4.9V (CN304 4)
REF 3.5V (CN303 9)
REF 1V (CN303 8)
Vcc
VDD
VSS
IRES REF
AGC REF
HALL GAIN
HALL OS
FADER MODE
FADER
FOCUS SPEED
ZOOM SPEED
DI
CLK
LD
SHUT LEV
Q516
AGC CONT R
AGC CONT
IC505 (1/4) AE COMPARATOR
Q515 INTEGRATOR
IC505 (1/4) TRIANGLE WAVEFORMER
IC505 (1/4) Q514 CURRENT SOURCE
IC507 DISCHARGE
AE
X501 8MHz
5.3Vp-p
IC501 33
CAM POWER
XTRQ
TRG
CCD DET SW
ZOOM KEY
VG
CN301
CCD DET SW
ZOOM SENS
F SENS 1
F SENS 2
IC501 53 SCK (H: 20µsec)
5Vp-p
CAM CS
CAM SO
CAM SI
SCK
LANC IN
LANC OUT
RESET
VDD
Q506(1/2)
Q505(1/2)
D503
IC508 VOLTAGE DETECT
SS4.9V (CN305 12)
Q504
D502
D501
AF A/D 1
AF A/D 2
AF A/D 3
XVD
HOLD RESET
IC502 DATA TRANSFER TIMING DECODER
DECODE A
DECODE B
DECODE C
DECODE D
FADER MODE
FADER
LD
EVR DATA
EVR CLK
Q502
AGC REF
SHUT LEV
STB
DATA
CK
BLK
CLP4
CL
AF CLK
IC656 (1/4) V REF
IC656 (1/4) BUFFER
IC656 (1/4) HALL OUT AMP
CAM 4.9V (CN304 4)
IRIS REF
HALL OUT
HALL OS
HALL GAIN
Q657 BUFFER
Q658 BUFFER
CAM UNREG (CN304 2)
Q651, 659 CURRENT LIMITER
Q653,6 5.5V REG
IC652 MOTOR DRIVE
FOCUS 1
FOCUS 2
FWD1
REV1
IN 1
ZOOM T
ZOOM W
FWD2
REV2
IN 2
FOCUS SPEED
ZOOM SPEED
IC653 BUFFER
CN305
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
LANC TO CAM
CAM TO LANC
SYSTEM RESET
DATA TO MODE
DATA TO CAM
SYSTEM CONTROL (VA-67)
SENS DRIVE
W801 5 14Vp-p (60Hz)
CN303 W801
AF A/D 1
AF A/D 2
AF A/D 3
XVD
HOLD RESET
J CS
J SI
J SCK
J16
IC801 D/A CONVERTER
SCK
DATA TO AF
J CS
DA STB
CLP4
AF CLK
BLK
Q801
GAIN3
GAIN2
GAIN1
IC806 BINARY COUNTER
CLOCK
RESET
Q802,803,805 AMP
IC805
IC803 COMPARATOR
W801 6 14Vp-p (60Hz)
W801 12 5Vp-p (V)
W801 2 0.4Vp-p (60Hz)
W801 10 5Vp-p (H)
REF 3.5V
REF 1V
CN303
W801
CAM4.9V (W801 2)
IC802 V REF
IC807 AUTO FOCUS DET&WINDOW
Q811
DIFFERENTIAL
LPF
Q809
Q810
IN 1
IN 2
IN 3
CLV
CLAMP
DET
MID OUT 1
MID OUT 2
MID OUT 3
MID IN 1
MID IN 2
MID IN 3
WNDS
CLP
OUT 1S
OUT 2S
OUT 3S
PH S
VCC
CAM 4.9V (W801 2)
GAIN3
GAIN2
GAIN1
BPF
IC808 (1/2) PEAK HOLD
IC809 (1/2) PEAK HOLD
Q814 HOLD RESET
Q815 HOLD RESET
Q812 HOLD RESET
AF A/D 1
AF A/D 2
AF A/D 3
HOLD RESET
Y LPF OUT (Q301)
YH LPF OUT (Q302)
CAMERA(1)
Q806 CLIP
Q807 DIFFERENTIAL
Q808 LPF
ZOOM SW
WIDE
TELE
CN306
ZOOM C
ZOOM W
ZOOM T
REF 1V (CN303 8)
REF 3.5V (CN303 9)
VC-94 BOARD (1/2) (See page 96.)
W801 3 0.9Vp-p (H)
W801 4 0.2Vp-p (H)
IC807 1 2.1Vp-p (H)
IC807 9 0.18Vp-p (H)
IC807 20 1.3Vp-p (H)
IC807 2 1.2Vp-p (H)
IC807 22 0.25Vp-p (60Hz)
IC807 23 0.9Vp-p (H)
IC807 16 0.65Vp-p (60Hz)
IC807 18 0.7Vp-p (60Hz)
W801 11 4.4Vp-p (H)
W801 1 0.5Vp-p (4.43MHz)

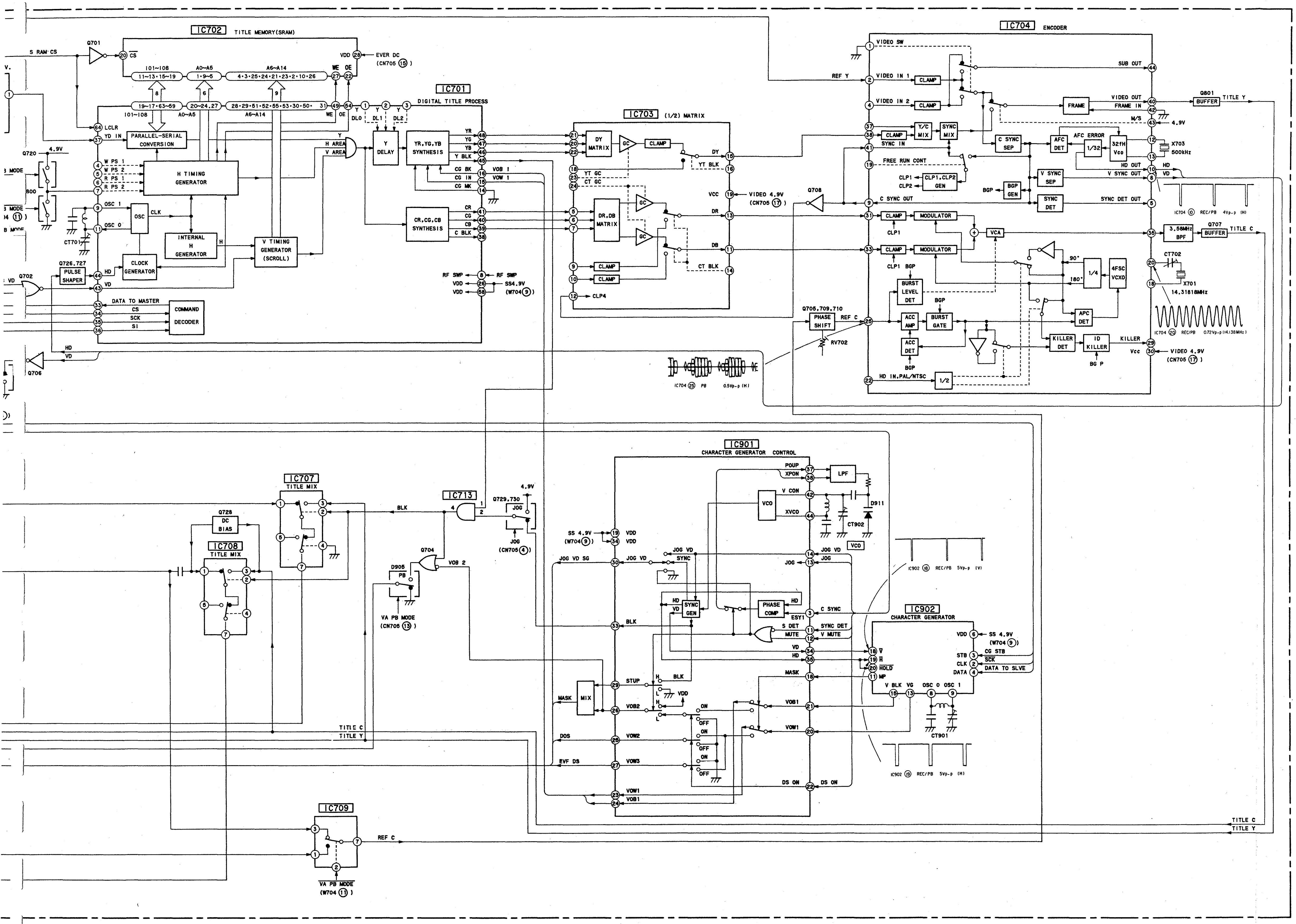

IC501 CAMERA CONTROL
IC509 (1/2) RGB SELECT
IC510 (1/4) AW COMPARATOR
IC510 (1/4) BUFFER
IC510 (1/4) TRIANGLE WAVEFORMER
IC510 (1/4) CURRENT SOURCE
IC509 (1/2) DISCHARGE
IC505 (1/4) AE COMPARATOR
IC505 (1/4) TRIANGLE WAVEFORMER
IC505 (1/4) CURRENT SOURCE
IC507 DISCHARGE
IC502 DATA TRANSFER TIMING DECODER
IC504 EVR/D-A CONVERTER
IC508 VOLTAGE DETECT
IC656 (1/4) BUFFER
IC656 (1/4) HALL OUT AMP
IC656 (1/4) V REF
IC656 (1/4) BIAS CURRENT CONTROL
IC651 (1/2) IRIS DRIVE
IC651 (1/2) BIAS(+) CONTROL
IC653 (1/2) VOLTAGE ERROR AMP
IC653 (1/2) BUFFER
IC652 MOTOR DRIVE
IRIS MOTOR
FOCUS MOTOR
ZOOM MOTOR
ZOOM POSITION SENSOR
FOCUS POSITION SENSOR
LENS BLOCK
SYSTEM CONTROL (VA-67)
IC801 D/A CONVERTER
IC806 BINARY COUNTER
IC805
IC804
IC803 COMPARATOR
IC802 V REF
IC807 AUTO FOCUS DET&WINDOW
IC808 (1/2) PEAK HOLD
IC809 (1/2) PEAK HOLD
CAMERA(1)
RD (1/2) (See page 96.)
AF-85 BOARD (See page 109.)

3-6. DIGITAL TITLER BLOCK DIAGRAM

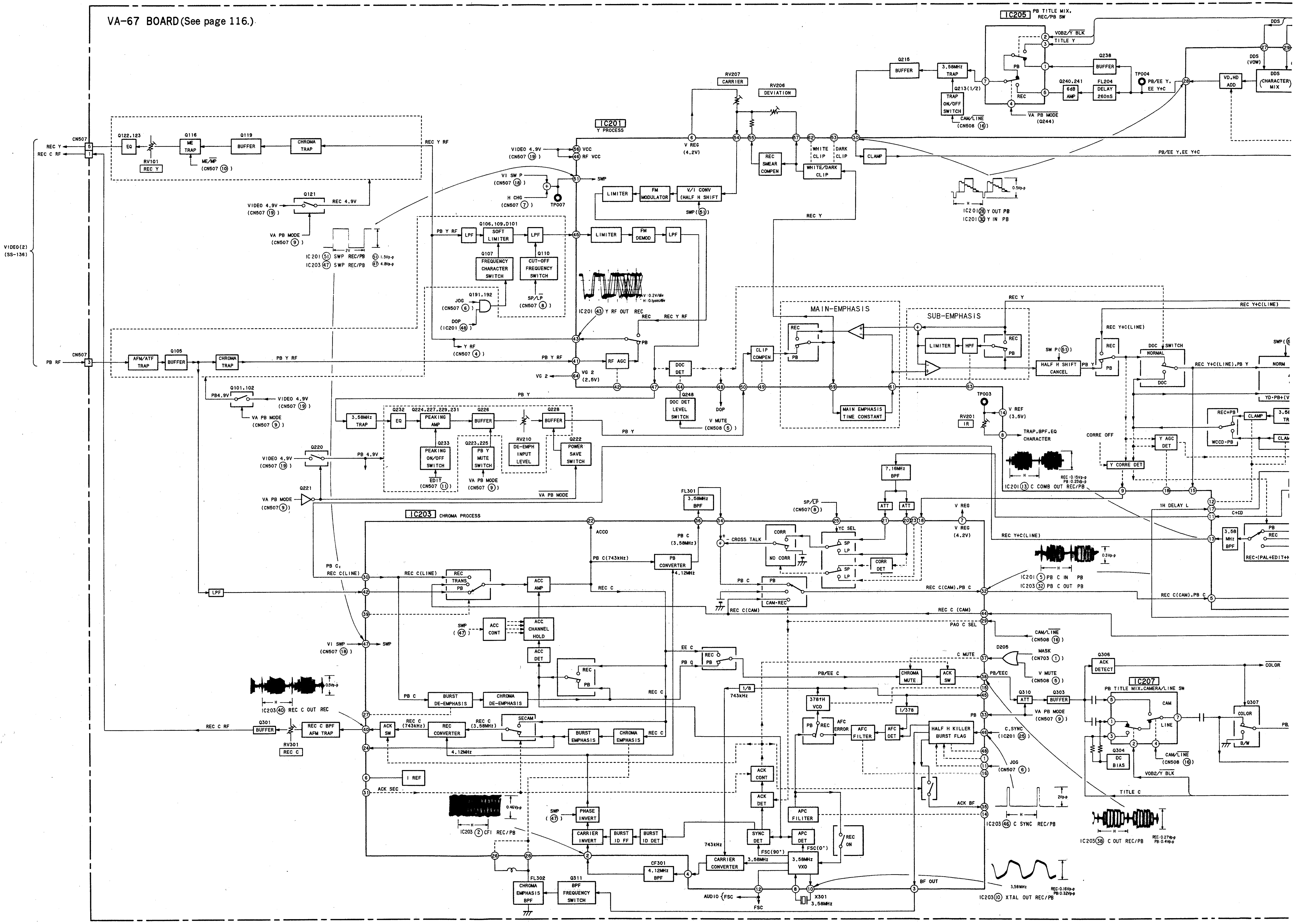

VA-67
BOARD
SERVO
(SS-136)
RF SWP
JOG
SYSTEM
CONTROL
(SS-136)
DS ON
JOG VD
SYNC DET
VA PB MODE
TITLE CS
S RAM CS
CG STB
EVER DC
SYSTEM
CONTROL
(FU-100)
V MUTE
DATA TO MASTER
SCK
DATA TO SLVE
CN
2
4
7
8
10
12
13
14
16
18
15
15
13
14
CAMERA(1)
(VC-94)
Y OUT
C OUT
W701
1
3
CAM Y
CAM C
CN704
2
4
2
4
VIDEO(1)
(VA-67)
REF Y
TITLE C
TITLE Y
VOB2/Y BLK
VA PB MODE
DOS
PB C
COMP SYNC
CAM/TITLE Y
CAM/TITLE C
MASK
JOG VD SG
EVF DS

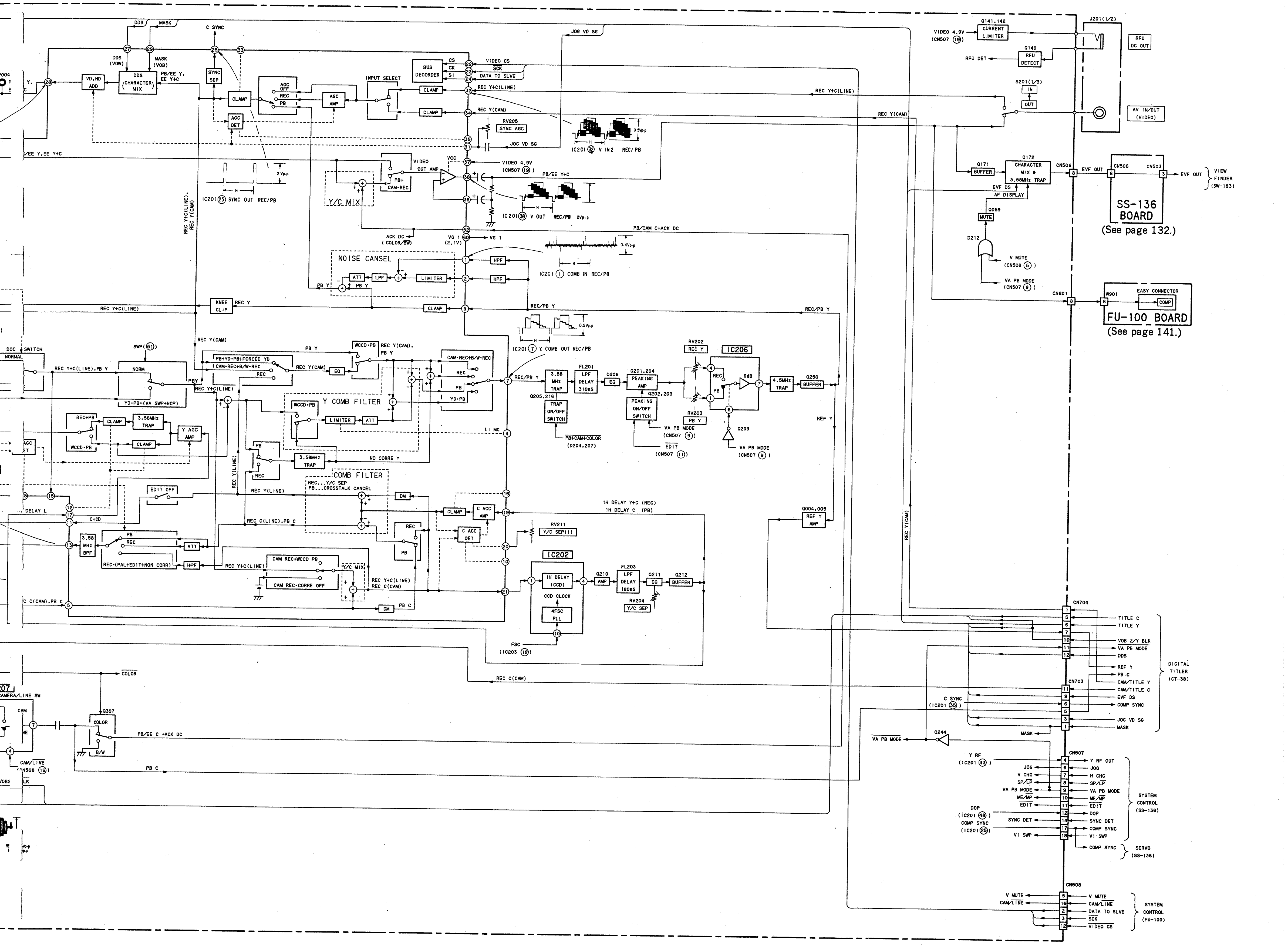
6. DIGITAL TITLER BLOCK DIAGRAM


CT-38 BOARD
(See page 113.)
VA-67 BOARD
SERVO (SS-136)
RF SWP
JOG
SYSTEM CONTROL (SS-136)
DS ON
JOG VD
SYNC DET
VA PB MODE
TITLE CS
S RAM CS
CG STB
EVER DC
SYSTEM CONTROL (FU-100)
V MUTE
DATA TO MASTER
SCK
DATA TO SLVE
CN705
W704
CAMERA(1) (VC-94)
Y OUT
C OUT
W701
CAM Y
CAM C
CN704
VIDEO(1) (VA-67)
REF Y
TITLE C
TITLE Y
VOB2/Y BLK
VA PB MODE
DOS
PB C
COMP SYNC
CAM/TITLE Y
CAM/TITLE C
MASK
JOG VD SG
EVF DS
IC703 (1/2) A-D CONV.
SYNC-TIP CLAMP
COMPARATOR
RV703
4.9V
Q701
S RAM CS
IC702 TITLE MEMORY(SRAM)
EVER DC (CN705 ⑮)
IC701 DIGITAL TITLE PROCESS
PARALLEL-SERIAL CONVERSION
H TIMING GENERATOR
INTERNAL H GENERATOR
V TIMING GENERATOR (SCROLL)
CLOCK GENERATOR
OSC
CT701
Q720
Q800
VA PB MODE (W704 ⑪)
Q702
Q726,727 PULSE SHAPER
DATA TO MASTER
CS
SCK
SI
COMMAND DECODER
Q703
Q706
JOG (CN705 ④)
DATA TO SLAVE
CG STB
C SYNC
Y DELAY
YR,YG,YB SYNTHESIS
CR,CG,CB SYNTHESIS
VOB 1
VOW 1
RF SWP
SS4.9V (W704 ⑨)
IC703 (1/2) MATRIX
DY MATRIX
DR,DB MATRIX
GC
CLAMP
YT GC
CT GC
YT BLK
CT BLK
CLP4
VCC
VIDEO 4.9V (CN705 ⑰)
Q708
VIDEO SW
VIDEO IN 1
VIDEO IN 2
SYNC IN
FREE RUN CONT
CLP1
CLP2
C SYNC OUT
MODULATOR
BGP
BURST LEVEL DET
Q705,709,710 PHASE SHIFT
REF C
RV702
ACC AMP
ACC DET
BURST GATE
HD IN,PAL/NTSC
IC704 ㉕ PB 0.5Vp-p (H)
IC707 TITLE MIX
IC708 TITLE MIX
Q728 DC BIAS
IC713
BLK
Q729,730
4.9V
JOG (CN705 ④)
Q704
VOB 2
D905
VA PB MODE (CN705 ⑬)
IC709
REF C
VA PB MODE (W704 ⑪)
IC901 CHARACTER GENERATOR CONTROL
POUP
XPON
LPF
V CON
XVCO
VCO
D911
CT902
SS 4.9V (W704 ⑨)
VDD
JOG VD SG
JOG VD
SYNC
SYNC GEN
PHASE COMP
C SYNC
SYNC DET
V MUTE
S DET
MUTE
VD
HD
MASK
MIX
STUP
VOB2
VOW2
VOW3
VOW1
VOB1
DOS
EVF DS
DS ON
IC902 CHARACTER GENERATOR
IC902 ⑱ REC/PB
IC902 ⑲ REC/PB 5Vp-p
V BLK
VG
OSC O
CT901
HOLD
MP

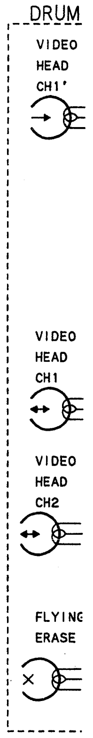

IC702 TITLE MEMORY(SRAM)
IC701 DIGITAL TITLE PROCESS
IC703 (1/2) MATRIX
IC704 ENCODER
IC901 CHARACTER GENERATOR CONTROL
IC902 CHARACTER GENERATOR
IC707 TITLE MIX
IC708 TITLE MIX
IC709
IC713
Q701
Q702
Q706
Q708
Q720
Q726,727
Q728
Q729,730
Q704
Q705,709,710
Q707
Q801
S RAM CS
EVER DC (CN705 ⑮)
PARALLEL-SERIAL CONVERSION
H TIMING GENERATOR
INTERNAL H GENERATOR
V TIMING GENERATOR (SCROLL)
CLOCK GENERATOR
OSC
PULSE SHAPER
COMMAND DECODER
DATA TO MASTER
CS
SCK
SI
Y DELAY
YR,YG,YB SYNTHESIS
CR,CG,CB SYNTHESIS
DY MATRIX
DR,DB MATRIX
CLAMP
GC
VIDEO 4.9V (CN705 ⑰)
RF SWP
SS4.9V (W704 ⑨)
VIDEO SW
VIDEO IN 1
VIDEO IN 2
REF Y
SUB OUT
VIDEO OUT
FRAME IN
FRAME
M/S
TITLE Y
BUFFER
Y/C MIX
SYNC MIX
SYNC IN
C SYNC SEP
AFC DET
AFC ERROR
1/32
32fH VCO
X703 500kHz
FREE RUN CONT
CLP1,CLP2 GEN
V SYNC SEP
BGP DET
SYNC DET
SYNC DET OUT
C SYNC OUT
HD OUT
V SYNC OUT
MODULATOR
VCA
3.58MHz BPF
TITLE C
CT702
X701 14.31818MHz
1/4
4FSC VCXO
90°
180°
BURST LEVEL DET
BURST GATE
ACC AMP
ACC DET
APC DET
KILLER DET
ID KILLER
KILLER
PHASE SHIFT
REF C
RV702
HD IN,PAL/NTSC
1/2
VIDEO 4.9V (CN705 ⑰)
IC704 ⑥ REC/PB 4Vp-p (H)
IC704 ⑳ REC/PB 0.72Vp-p (4.43MHz)
IC704 ㉕ PB 0.5Vp-p (H)
POUP
XPON
LPF
VCO
V CON
XVCO
D911
CT902
JOG VD
SYNC
SYNC GEN
PHASE COMP
C SYNC
ESYI
S DET
MUTE
SYNC DET
V MUTE
MASK
MIX
STUP
BLK
VOB1
VOB2
VOW1
VOW2
VOW3
DOS
EVF DS
DS ON
JOG (CN705 ④)
SS 4.9V (W704 ⑨)
VDD
CG STB
DATA TO SLVE
OSC 0
OSC 1
CT901
IC902 ⑱ REC/PB 5Vp-p (V)
IC902 ⑲ REC/PB 5Vp-p (H)
DC BIAS
D905
VA PB MODE (CN705 ⑬)
VA PB MODE (W704 ⑪)
TITLE C
TITLE Y
REF C
4.9V

3-7. VIDEO (1) BLOCK DIAGRAM

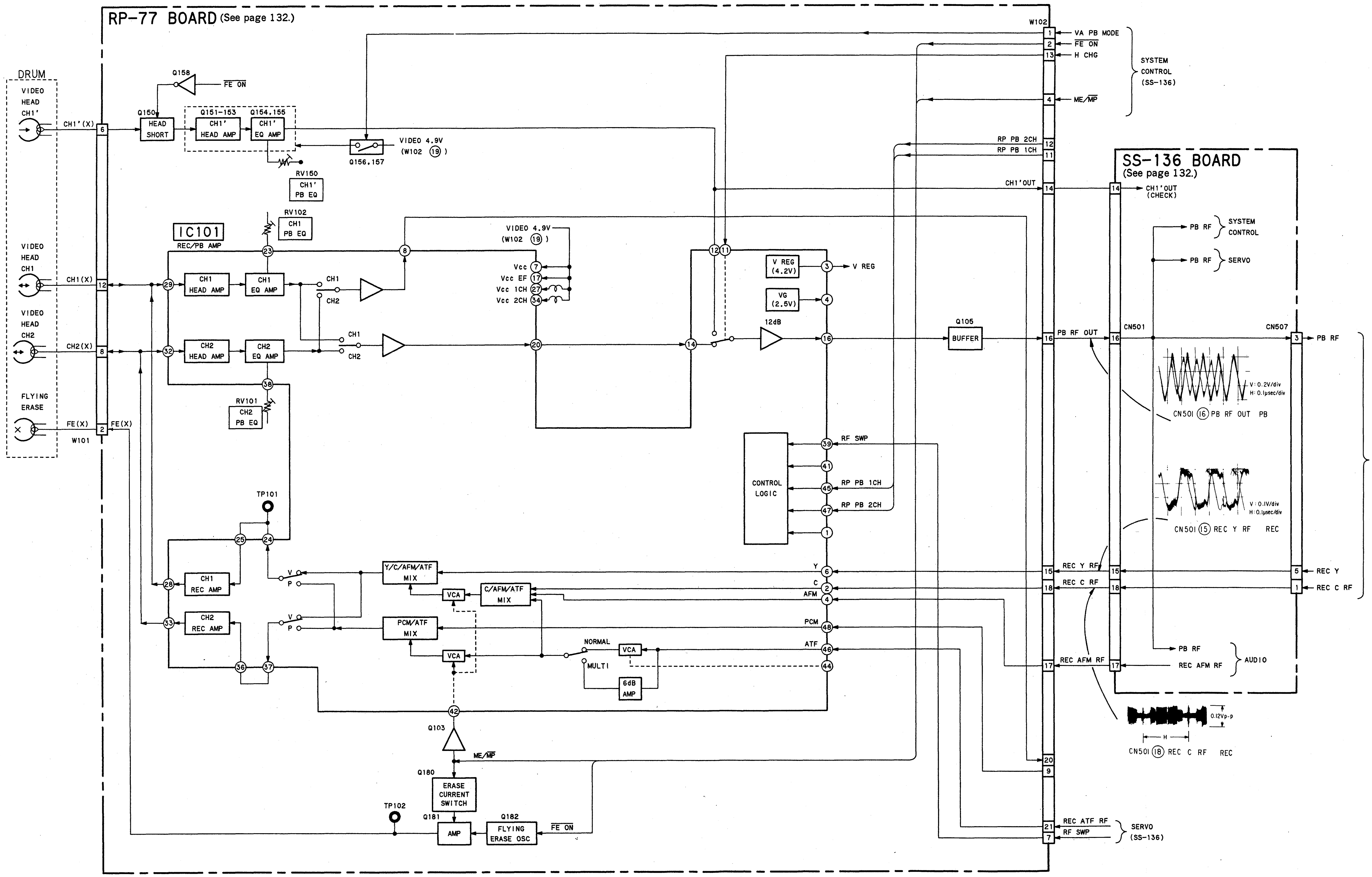

VA-67 BOARD (See page 116.)
VIDEO(2) (SS-136)
CN507
REC Y
REC C RF
PB RF
Q122,123 EQ
RV101 REC Y
Q116 ME TRAP
Q119 BUFFER
CHROMA TRAP
ME/MP (CN507 ⑩)
REC Y RF
Q121
VIDEO 4.9V (CN507 ⑲)
REC 4.9V
VA PB MODE (CN507 ⑨)
IC201 ㊶ SWP REC/PB
IC203 ㊼ SWP REC/PB
AFM/ATF TRAP
Q105 BUFFER
CHROMA TRAP
PB Y RF
Q101,102
PB4.9V
IC201 Y PROCESS
VIDEO 4.9V (CN507 ⑲)
VCC
RF VCC
VI SW P (CN507 ⑱)
H CHG (CN507 ⑦)
TP007
SWP
LIMITER
FM MODULATOR
V/I CONV (HALF H SHIFT)
Q106,109,D101 SOFT LIMITER
LPF
Q107 FREQUENCY CHARACTER SWITCH
Q110 CUT-OFF FREQUENCY SWITCH
Q191,192
JOG (CN507 ⑥)
DOP (IC201 ㊽)
SP/LP (CN507 ⑧)
FM DEMOD
IC201 ㊸ Y RF OUT REC
Y RF (CN507 ④)
RF AGC
VG 2 (2.5V)
DOC DET
Q248 DOC DET LEVEL SWITCH
V MUTE (CN508 ⑤)
DOP
CLIP COMPEN
MAIN-EMPHASIS
MAIN EMPHASIS TIME CONSTANT
SUB-EMPHASIS
LIMITER
HPF
HALF H SHIFT CANCEL
SW P(㉛)
RV207 CARRIER
RV206 DEVIATION
V REG (4.2V)
REC SMEAR COMPEN
WHITE CLIP
DARK CLIP
WHITE/DARK CLIP
CLAMP
REC Y
PB/EE Y,EE Y+C
IC201 ㉘ Y OUT PB
IC201 ㉚ Y IN PB
IC205 PB TITLE MIX, REC/PB SW
VOB2/Y BLK
TITLE Y
Q215 BUFFER
3.58MHz TRAP
Q213(1/2) TRAP ON/OFF SWITCH
CAM/LINE (CN508 ⑯)
VA PB MODE (Q244)
Q238 BUFFER
Q240,241 6dB AMP
FL204 DELAY 260nS
TP004 PB/EE Y, EE Y+C
VD,HD ADD
DDS (VOW)
DDS (CHARACTER) MIX
REC Y+C(LINE)
SWITCH
NORMAL
DOC
REC Y+C(LINE),PB Y
TP003
V REF (3.5V)
RV201 IR
TRAP,BPF,EQ CHARACTER
CORRE OFF
Y AGC DET
Y CORRE DET
WCCD·PB
REC+PB
CLAMP
IC201 ⑬ C COMB OUT REC/PB
1H DELAY L
C+CD
3.58 MHz BPF
REC·(PAL+EDIT+)
Q232 EQ
Q224,227,229,231 PEAKING AMP
Q226 BUFFER
Q228 BUFFER
3.58MHz TRAP
Q233 PEAKING ON/OFF SWITCH
EDIT (CN507 ⑪)
Q223,225 PB Y MUTE SWITCH
VA PB MODE (CN507 ⑨)
RV210 DE-EMPH INPUT LEVEL
Q222 POWER SAVE SWITCH
Q220
PB 4.9V
Q221
VA PB MODE
PB Y
IC203 CHROMA PROCESS
FL301 3.58MHz BPF
7.16MHz BPF
ATT
SP/LP (CN507 ⑧)
V REG (4.2V)
ACCO
PB C (3.58MHz)
PB C(743kHz)
PB CONVERTER
4.12MHz
CROSS TALK
CORR
NO CORR
YC SEL
CORR DET
PB C, REC C(LINE)
REC C(LINE)
REC TRANS PB
ACC AMP
LPF
REC C
CAM·REC
REC C(CAM)
REC C(CAM),PB C
IC201 ⑤ PB C IN PB
IC203 ㉜ PB C OUT PB
PAO C SEL
SWP (㊼)
ACC CONT
ACC CHANNEL HOLD
ACC DET
VI SWP (CN507 ⑱)
EE C
PB C
C MUTE
D205
CAM/LINE (CN508 ⑯)
MASK (CN703 ①)
V MUTE (CN508 ⑤)
PB/EEC
CHROMA MUTE
ACK SW
1/8
743kHz
378fH VCO
1/378
AFC ERROR
AFC FILTER
AFC DET
HALF H KILLER BURST FLAG
C.SYNC (IC201 ㉕)
JOG (CN507 ⑥)
Q306 ACK DETECT
COLOR
IC207 PB TITLE MIX,CAMERA/LINE SW
Q310 ATT
Q303 BUFFER
VA PB MODE (CN507 ⑨)
CAM
LINE
Q304 DC BIAS
CAM/LINE (CN508 ⑯)
VOB2/Y BLK
TITLE C
Q307 COLOR B/W
IC203 ㊵ REC C OUT REC
Q301 BUFFER
RV301 REC C
REC C BPF AFM TRAP
REC C RF
ACK SW
REC C (743kHz)
REC CONVERTER
REC C (3.58MHz)
SECAM
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
BURST EMPHASIS
CHROMA EMPHASIS
I REF
ACK SEC
IC203 ② CFI REC/PB
PHASE INVERT
CARRIER INVERT
BURST ID FF
BURST ID DET
ACK CONT
ACK DET
APC FILTER
SYNC DET
APC DET
FSC(90°)
FSC(0°)
743kHz
CARRIER CONVERTER
3.58MHz VXO
REC ON
CF301 4.12MHz BPF
FL302 CHROMA EMPHASIS BPF
Q311 BPF FREQUENCY SWITCH
AUDIO {FSC
FSC
X301 3.58MHz
BF OUT
ACK BF
IC203 ㊻ C SYNC REC/PB
IC203 ㊳ C OUT REC/PB
IC203 ⑩ XTAL OUT REC/PB


IC201
IC202
IC206
INPUT SELECT
BUS DECORDER
AGC AMP
AGC DET
SYNC SEP
CLAMP
DDS (CHARACTER) MIX
VD, HD ADD
Y/C MIX
NOISE CANSEL
LIMITER
LPF
ATT
HPF
KNEE CLIP
Y COMB FILTER
COMB FILTER
REC...Y/C SEP
PB...CROSSTALK CANCEL
3.58MHz TRAP
Y AGC AMP
C ACC AMP
C ACC DET
1H DELAY (CCD)
CCD CLOCK
4FSC PLL
LPF DELAY 310nS
LPF DELAY 180nS
PEAKING AMP
PEAKING ON/OFF SWITCH
TRAP ON/OFF SWITCH
4.5MHz TRAP
BUFFER
REF Y AMP
RV202 REC Y
RV203 PB Y
RV204 Y/C SEP
RV205 SYNC AGC
RV211 Y/C SEP(1)
Q141,142 CURRENT LIMITER
Q140 RFU DETECT
Q171 BUFFER
Q172 CHARACTER MIX & 3.58MHz TRAP
Q059 MUTE
S201(1/3) IN OUT
J201(1/2)
RFU DC OUT
AV IN/OUT (VIDEO)
CN506
CN503
EVF OUT
VIEW FINDER (SW-183)
SS-136 BOARD
(See page 132.)
CN801
W901
EASY CONNECTOR
COMP
FU-100 BOARD
(See page 141.)
CN704
CN703
CN507
CN508
TITLE C
TITLE Y
VDB 2/Y BLK
VA PB MODE
DDS
REF Y
PB C
CAM/TITLE Y
CAM/TITLE C
EVF DS
COMP SYNC
JOG VD SG
MASK
DIGITAL TITLER (CT-38)
Y RF OUT
JOG
H CHG
SP/LP
ME/MP
EDIT
DOP
SYNC DET
VI SWP
SYSTEM CONTROL (SS-136)
SERVO (SS-136)
V MUTE
CAM/LINE
DATA TO SLVE
SCK
VIDEO CS
SYSTEM CONTROL (FU-100)
REC Y+C(LINE)
REC Y(CAM)
REC C(CAM)
PB/EE Y+C
PB/CAM C+ACK DC
REC/PB Y
IC201 ㉕ SYNC OUT REC/PB
IC201 ㉜ V IN2 REC/PB
IC201 ㊳ V OUT REC/PB 2Vp-p
IC201 ① COMB IN REC/PB
IC201 ⑦ Y COMB OUT REC/PB
Q307 COLOR B/W
CAMERA/LINE SW
PB/EE C +ACK DC
COLOR
Q244

3-8. VIDEO (2)

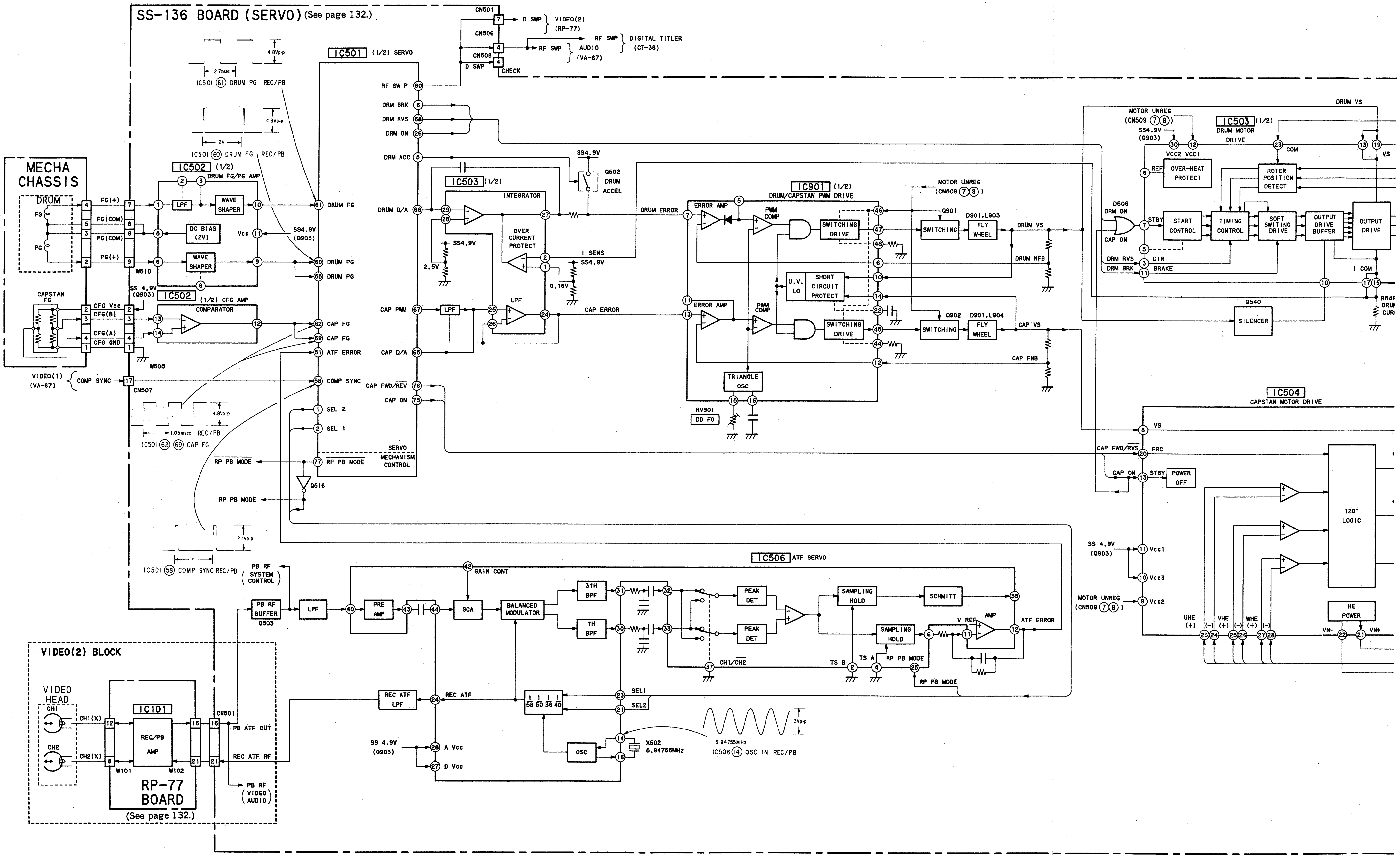

DRUM
VIDEO
HEAD
CH1'
VIDEO
HEAD
CH1
VIDEO
HEAD
CH2
FLYING
ERASE

3-8. VIDEO (2) BLOCK DIAGRAM

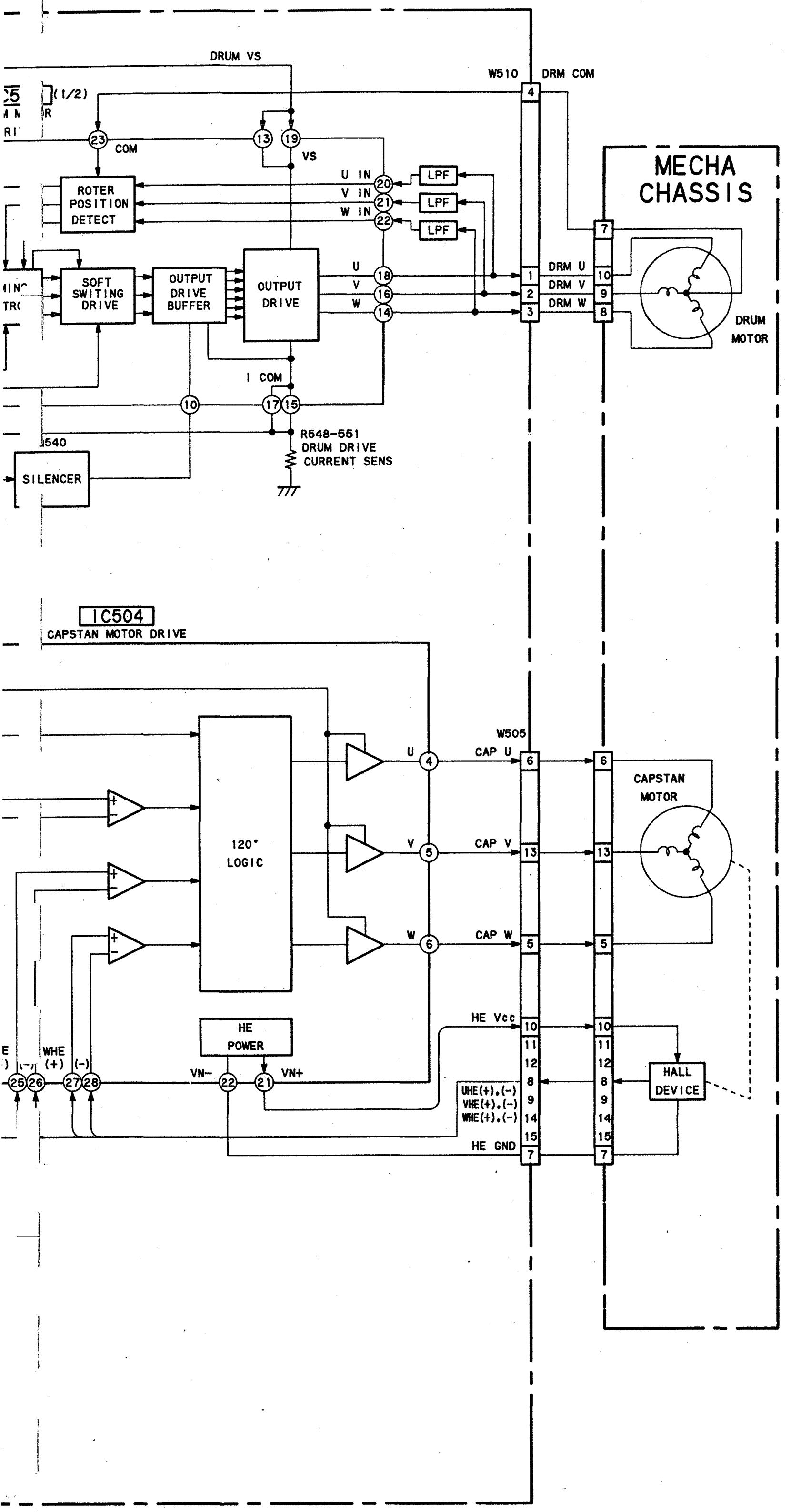


RP-77 BOARD (See page 132.)
SS-136 BOARD (See page 132.)
DRUM
VIDEO HEAD CH1'
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
CH1'(X)
CH1(X)
CH2(X)
FE(X)
W101
W102
Q158
FE ON
Q150
HEAD SHORT
Q151-153
CH1' HEAD AMP
Q154,155
CH1' EQ AMP
RV150
CH1' PB EQ
Q156,157
VIDEO 4.9V (W102 ⑲)
IC101
REC/PB AMP
RV102
CH1 PB EQ
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
RV101
CH2 PB EQ
CH1
CH2
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
V REG (4.2V)
VG (2.5V)
V REG
12dB
Q105
BUFFER
CONTROL LOGIC
RF SWP
RP PB 1CH
RP PB 2CH
TP101
CH1 REC AMP
CH2 REC AMP
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
NORMAL
MULTI
6dB AMP
Y
C
AFM
PCM
ATF
Q103
ME/MP
Q180
ERASE CURRENT SWITCH
TP102
Q181
AMP
Q182
FLYING ERASE OSC
VA PB MODE
H CHG
SYSTEM CONTROL (SS-136)
RP PB 2CH
RP PB 1CH
CH1'OUT
PB RF OUT
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
RF SWP
SERVO (SS-136)
CH1'OUT (CHECK)
PB RF
SYSTEM CONTROL
SERVO
CN501
CN507
V: 0.2V/div H: 0.1μsec/div
CN501 ⑯ PB RF OUT PB
V: 0.1V/div H: 0.1μsec/div
CN501 ⑮ REC Y RF REC
REC Y
REC C RF
REC AFM RF
AUDIO
VIDEO(1) (VA-67)
0.12Vp-p
H
CN501 ⑱ REC C RF REC

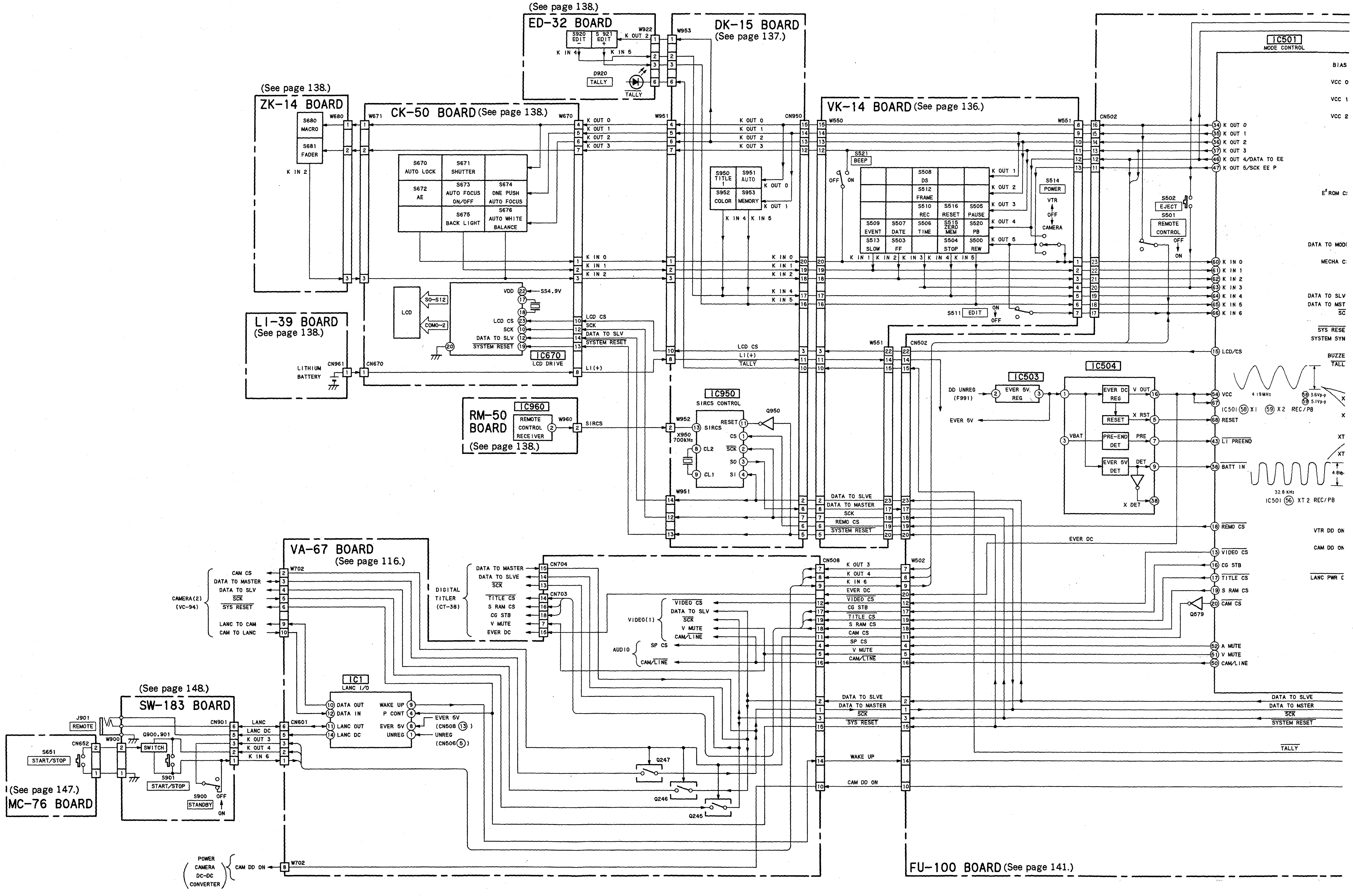
3-9. SERVO BLOCK DIAGRAM

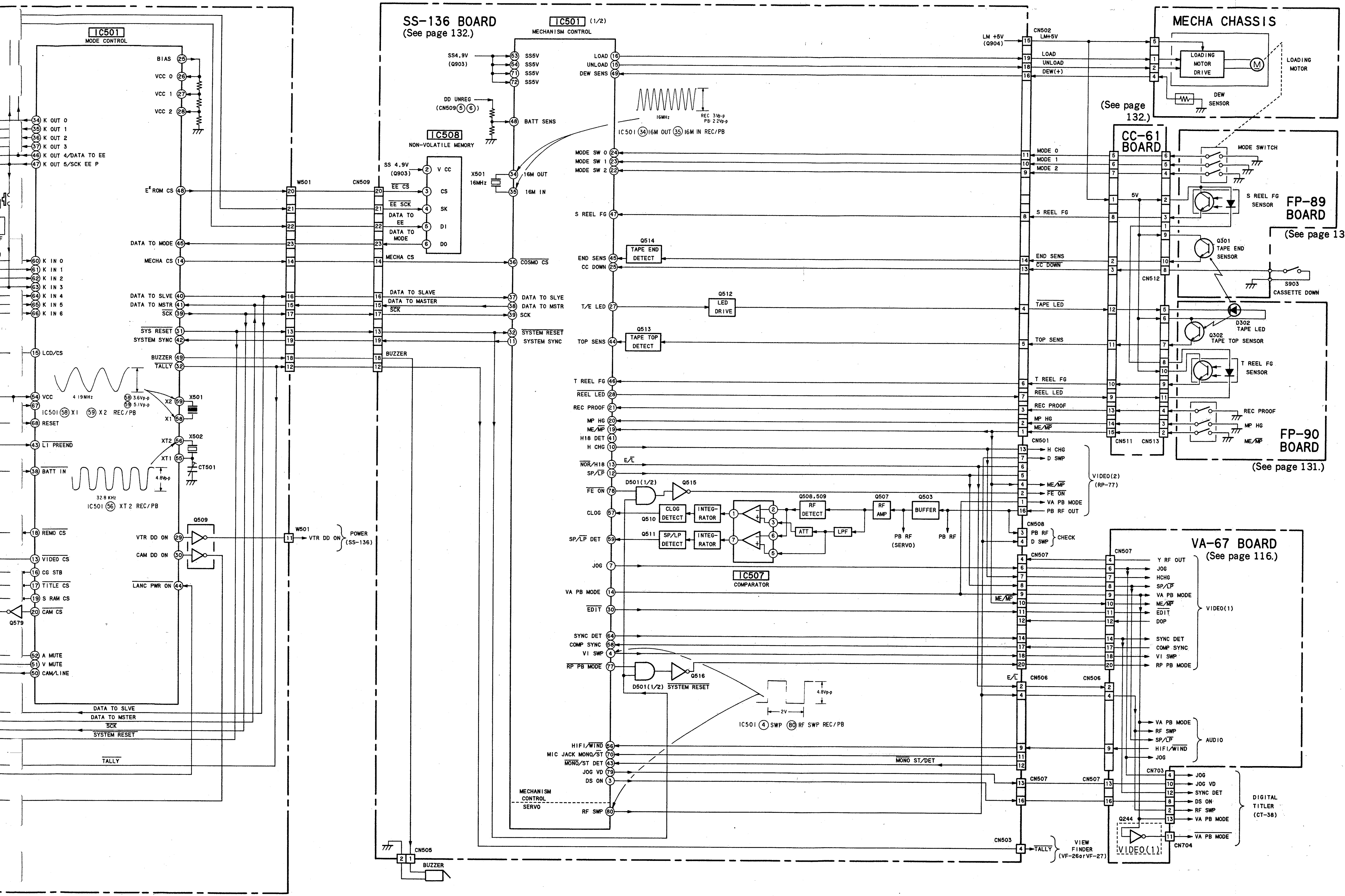


SS-136 BOARD (SERVO) (See page 132.)
MECHA CHASSIS
DRUM
FG
PG
CAPSTAN FG
FG(+)
FG(COM)
PG(COM)
PG(+)
W510
CFG Vcc
CFG(B)
CFG(A)
CFG GND
W505
SS 4.9V (Q903)
VIDEO(1) (VA-67)
COMP SYNC
CN507
IC502 (1/2) DRUM FG/PG AMP
LPF
WAVE SHAPER
DC BIAS (2V)
Vcc
SS4.9V (Q903)
IC502 (1/2) CFG AMP
COMPARATOR
IC501 (61) DRUM PG REC/PB
2.7msec
4.8Vp-p
IC501 (60) DRUM FG REC/PB
2V
IC501 (62) (69) CAP FG
1.05msec REC/PB
IC501 (58) COMP SYNC REC/PB
2.1Vp-p
H
IC501 (1/2) SERVO
RF SW P
DRM BRK
DRM RVS
DRM ON
DRM ACC
DRUM D/A
CAP PWM
CAP D/A
CAP FWD/REV
CAP ON
DRUM FG
DRUM PG
CAP FG
ATF ERROR
COMP SYNC
SEL 2
SEL 1
RP PB MODE
SERVO MECHANISM CONTROL
Q516
CN501
CN506
CN508
D SWP
VIDEO(2) (RP-77)
RF SWP
AUDIO (VA-67)
DIGITAL TITLER (CT-38)
CHECK
IC503 (1/2)
INTEGRATOR
OVER CURRENT PROTECT
SS4.9V
2.5V
0.16V
I SENS
DRUM ERROR
CAP ERROR
Q502 DRUM ACCEL
IC901 (1/2) DRUM/CAPSTAN PWM DRIVE
ERROR AMP
PWM COMP
SWITCHING DRIVE
U.V. LO
SHORT CIRCUIT PROTECT
TRIANGLE OSC
RV901 DD FO
MOTOR UNREG (CN509 (7)(8))
Q901
SWITCHING
D901,L903
FLY WHEEL
DRUM VS
DRUM NFB
Q902
D901,L904
CAP VS
CAP FNB
IC503 (1/2) DRUM MOTOR DRIVE
SS4.9V (Q903)
VCC2 VCC1
COM
VS
REF
OVER-HEAT PROTECT
ROTER POSITION DETECT
D506
DRM ON
CAP ON
STBY
START CONTROL
TIMING CONTROL
SOFT SWITING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
DRM RVS
DRM BRK
DIR
BRAKE
I COM
Q540
SILENCER
R548
IC504 CAPSTAN MOTOR DRIVE
VS
CAP FWD/RVS
FRC
STBY
POWER OFF
SS 4.9V (Q903)
Vcc1
Vcc3
MOTOR UNREG (CN509 (7)(8))
Vcc2
120° LOGIC
HE POWER
UHE (+) (-)
VHE (+) (-)
WHE (+) (-)
VN-
VN+
IC506 ATF SERVO
GAIN CONT
PB RF SYSTEM CONTROL
PB RF BUFFER
Q503
LPF
PRE AMP
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
PEAK DET
SAMPLING HOLD
SCHMITT
V REF
AMP
ATF ERROR
CH1/CH2
TS B
TS A
RP PB MODE
REC ATF LPF
REC ATF
SEL1
SEL2
SS 4.9V (Q903)
A Vcc
D Vcc
OSC
X502 5.94755MHz
IC506 (14) OSC IN REC/PB
3Vp-p
VIDEO(2) BLOCK
VIDEO HEAD
CH1
CH2
CH1(X)
CH2(X)
IC101
REC/PB AMP
W101
W102
RP-77 BOARD (See page 132.)
CN501
PB ATF OUT
REC ATF RF
PB RF (VIDEO AUDIO)


DRUM VS
(1/2)
W510
DRM COM
23
COM
13
19
VS
U IN
V IN
W IN
20
21
22
LPF
LPF
LPF
ROTER
POSITION
DETECT
SOFT
SWITING
DRIVE
OUTPUT
DRIVE
BUFFER
OUTPUT
DRIVE
U
V
W
18
16
14
DRM U
DRM V
DRM W
I COM
10
17
15
R548-551
DRUM DRIVE
CURRENT SENS
SILENCER
MECHA
CHASSIS
DRUM
MOTOR
IC504
CAPSTAN MOTOR DRIVE
120°
LOGIC
U
V
W
4
5
6
W505
CAP U
CAP V
CAP W
CAPSTAN
MOTOR
HE Vcc
HE
POWER
VN-
VN+
22
21
WHE
(+)
(-)
25
26
27
28
UHE(+),(-)
VHE(+),(-)
WHE(+),(-)
HE GND
HALL
DEVICE
1
2
3
4
7
8
9
10
11
12
13
14
15

3-10. SYSTEM CONTROL BLOCK DIAGRAM


(See page 138.)
ED-32 BOARD
S920 EDIT −
S921 EDIT +
D920 TALLY
DK-15 BOARD
(See page 137.)
(See page 138.)
ZK-14 BOARD
S680 MACRO
S681 FADER
CK-50 BOARD (See page 138.)
S670 AUTO LOCK
S671 SHUTTER
S672 AE
S673 AUTO FOCUS ON/OFF
S674 ONE PUSH AUTO FOCUS
S675 BACK LIGHT
S676 AUTO WHITE BALANCE
LCD
IC670 LCD DRIVE
LI-39 BOARD
(See page 138.)
LITHIUM BATTERY
RM-50 BOARD
(See page 138.)
IC960 REMOTE CONTROL RECEIVER
IC950 SIRCS CONTROL
X950 700kHz
VK-14 BOARD (See page 136.)
S521 BEEP
S950 TITLE
S951 AUTO
S952 COLOR
S953 MEMORY
S508 DS
S512 FRAME
S510 REC
S516 RESET
S505 PAUSE
S509 EVENT
S507 DATE
S506 TIME
S515 ZERO MEM
S520 PB
S513 SLOW
S503 FF
S504 STOP
S500 REW
S514 POWER VTR OFF CAMERA
S511 EDIT
S502 EJECT
S501 REMOTE CONTROL
IC501 MODE CONTROL
IC503 EVER 5V REG
IC504
EVER DC REG
RESET
PRE-END DET
EVER 5V DET
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4/DATA TO EE
K OUT 5/SCK EE P
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
LCD CS
SCK
DATA TO SLV
DATA TO MASTER
SYSTEM RESET
REMO CS
TALLY
EVER DC
VIDEO CS
CG STB
TITLE CS
S RAM CS
CAM CS
A MUTE
V MUTE
CAM/LINE
VA-67 BOARD
(See page 116.)
CAMERA(2) (VC-94)
DIGITAL TITLER (CT-38)
VIDEO(1)
AUDIO
IC1 LANC I/O
LANC TO CAM
CAM TO LANC
Q247
Q246
Q245
Q579
(See page 148.)
SW-183 BOARD
J901 REMOTE
S900 STANDBY
S901 START/STOP
(See page 147.)
MC-76 BOARD
S651 START/STOP
POWER CAMERA DC-DC CONVERTER
CAM DD ON
WAKE UP
FU-100 BOARD (See page 141.)



IC501
MODE CONTROL
SS-136 BOARD
(See page 132.)
IC501 (1/2)
MECHANISM CONTROL
IC508
NON-VOLATILE MEMORY
MECHA CHASSIS
LOADING MOTOR DRIVE
LOADING MOTOR
DEW SENSOR
CC-61 BOARD
(See page 132.)
FP-89 BOARD
(See page 131.)
FP-90 BOARD
(See page 131.)
VA-67 BOARD
(See page 116.)
MODE SWITCH
S REEL FG SENSOR
Q301 TAPE END SENSOR
S903 CASSETTE DOWN
D302 TAPE LED
Q302 TAPE TOP SENSOR
T REEL FG SENSOR
REC PROOF
MP HG
ME/MP
W501
CN509
CN502
CN501
CN503
CN505
CN506
CN507
CN508
CN511
CN512
CN513
CN703
CN704
X501
X502
CT501
Q509
Q512 LED DRIVE
Q513 TAPE TOP DETECT
Q514 TAPE END DETECT
Q503 BUFFER
Q507 RF AMP
Q508,509 RF DETECT
Q510 CLOG DETECT
Q511 SP/LP DETECT
INTEG-RATOR
ATT
LPF
IC507 COMPARATOR
D501(1/2)
Q515
Q516
D501(1/2) SYSTEM RESET
MECHANISM CONTROL SERVO
BUZZER
POWER (SS-136)
VIDEO(2) (RP-77)
VIDEO(1)
AUDIO
DIGITAL TITLER (CT-38)
VIEW FINDER (VF-26 or VF-27)
CHECK
PB RF (SERVO)
PB RF
16MHz REC 3Vp-p PB 2.2Vp-p
IC501 ㉞16M OUT ㉟16M IN REC/PB
4.19MHz
IC501 58 X1 59 X2 REC/PB
32.8kHz
IC501 56 XT2 REC/PB
4.8Vp-p
2V
IC501 ④ SWP 80 RF SWP REC/PB

3-11. SERVO, SYSTEM CONTROL SYSTEM TERMINAL FUNCTION SS-136 BOARD IC501 (CXP-80116)

PIN No.	Signal Name	I/O	Function	Connection
1	SEL2	O	ATF REF PILOT signal frequency control ATF REF PILOT f1 f2 f3 f4 SEL 1 H L H L SEL 2 H H L L	ATF IC CXA1204Q
2	SEL1	O		
3	DS ON	O	Data Screen ON/OFF control Data Screen On and Data Screen key are selected with "H"	VIDEO block
4	VI SWP	O	RF SWP using for Vidoe system Normally, same as RF SWP. When using 'CH only "H" 3Head is used.	VIDEO block
5	DRM ACC	O	DRUM motor acceleration signal Acceleration is selected with "H"	To Drum motor driver CXA8006M
6	DRM BLK	O	DRUM motor brake signal Brake is selected with "H"	To Drum motor driver CXA8006M
7	JOG	O	Normal/JOG mode recognition signal JOG is selected with "H"	R/P Amp VIDEO block
8	FE RA	—	Not used	——
9	FE RS	—		
10	H CHG	O	2CH or 'CH select signal 'CH is selected with "H" Only 3Head is used	VIDEO system R/P Amp
11	SYSTEM SYNC	O	Internal bus communication synchronizing signal (V synchronization)	Mode controller
12	SP/$\overline{\text{LP}}$	O	SP/LP mode recognition signal SP mode is selected with "H"	R/P Amp VIDEO/AUDIO block
13	$\overline{\text{NOR}}$/Hi8	O	Not used Normally, "L"	——
14	VA PB MODE	O	VIDEO/AUDIO system REC/PB mode select PB mode is selected with "H"	VIDEO/AUDIO block
15	UNLOAD	O	Loading motor control signal OFF LOADING UNLOADING BRAKE LOAD L H L H UNLOAD L L H H	To loading motor
16	LOAD	O		
17	CAP ON2	—	Not used	——
18	AF REC	—	Not used	——
19	ME/$\overline{\text{MP}}$	I	ME/MP tape recognition input ME tape is selected with "H"	To CC board
20	MP HG	I	MP HG tape recognition input MPHG is selected with "L"	To CC board
21	REC PROOF	I	REC PROOF recognition input REC PROOF is selected with "L"	To CC board
22	MODE SW2	I	Mechanical position input	To CC board
23	MODE SW1	I		
24	MODE SW0	I		
25	$\overline{\text{CC DOWN}}$	I	Cassette IN switch input Cassette IN is selected with "L"	To CC board
26	DRM ON	O	Drum motor drive control Motor Drive is selected with "H"	To Drum motor driver CXA8006M
27	T/E LED	O	LED for tape top end sensor drive control LED Flashing is selected with "H"	To CC board
28	$\overline{\text{REEL LED}}$	O	LED for reel sensor drive control LED Flashing is selected with "L"	To CC board

PIN No.	Signal Name	I/O	Function	Connection
29		—	Not used	——
30	$\overline{\text{EDIT}}$	O	EDIT ON/OFF control EDIT is selected with "L"and interlocked with EDIT key.	To VIDEO block
31	SS GND	—	—	——
32	$\overline{\text{SYSTEM RESET}}$	I	Control by mode controller with RESET terminal of this microcomputer RESET is selected "L"	Mode controller and others
33	SS GND	—	—	——
34	16M OUT	O	Crystal connecting terminal for system clock oscillation (16 MHz)	X'tal (X501)
35	16M IN	I		
36	$\overline{\text{COSMO CS}}$	I	Select signal of this microcomputer from internal bus communication mode controller Selected with "L"	Mode controller
37	DATA TO SLVE	I	Serial data input terminal	Mode controller
38	DATA TO MSTR	O	Serial data output terminal	Mode controller
39	$\overline{\text{SCK}}$	I	Serial clock input terminal	Mode controller
40	PCM ACT	—	Not used	——
41	Hi8 DET	—	Not used Normally, "L"	——
42	S IN	—	Not used Normally, "H"	——
43	$\overline{\text{MONO}}$/ST DET	I	AFM monaural/stereo recognition input Stereo is selected "H" (Only stereo correspondence model)	To AUDIO block
44	TOP SENS	I	Tape top end sensor input TOP is selected with "H"	To CC board
45	END SENS	I	END is selected with "H"	
46	T REEL FG	I	Reel sensor input Take up side	To CC board
47	S REEL FG	I	Reel sensor input Supply side	
48	BATT SENS	I	Battery input voltage sense	——
49	DEW SENS	I	DEW SENSOR input	DEW SENSOR
50	THERMISTOR	I	THERMISTOR input (This model: fixed value)	
51	ATF ERROR	I	ATF errer (ATF LOCK error) input, A/D input terminal	IC506⑫
52	SS GND	—	—	——
53 54	SS 4.9V		Power source supply terminal	
55	DRM PG	I	DRUM PG input, FRC (high precision timer) capture input terminal	IC502 ⑨
56	$\overline{\text{HiFi}}$/WIND	I	MIC HiFi/WIND input. HiFi is selected with "L", WIND is selected with "H"	To AUDIO block
57	CLOG	I	Clog detection signal input. CLOG is selected with "H"	Q510 ©
58	COMP SYNC	I	Composite trunk (composite synchronizing signal) input. (built-inV SYNC separator)	To VIDEO block
59	SP/$\overline{\text{LP}}$ DET	I	SP/LP recognition signal input	Q511 ©

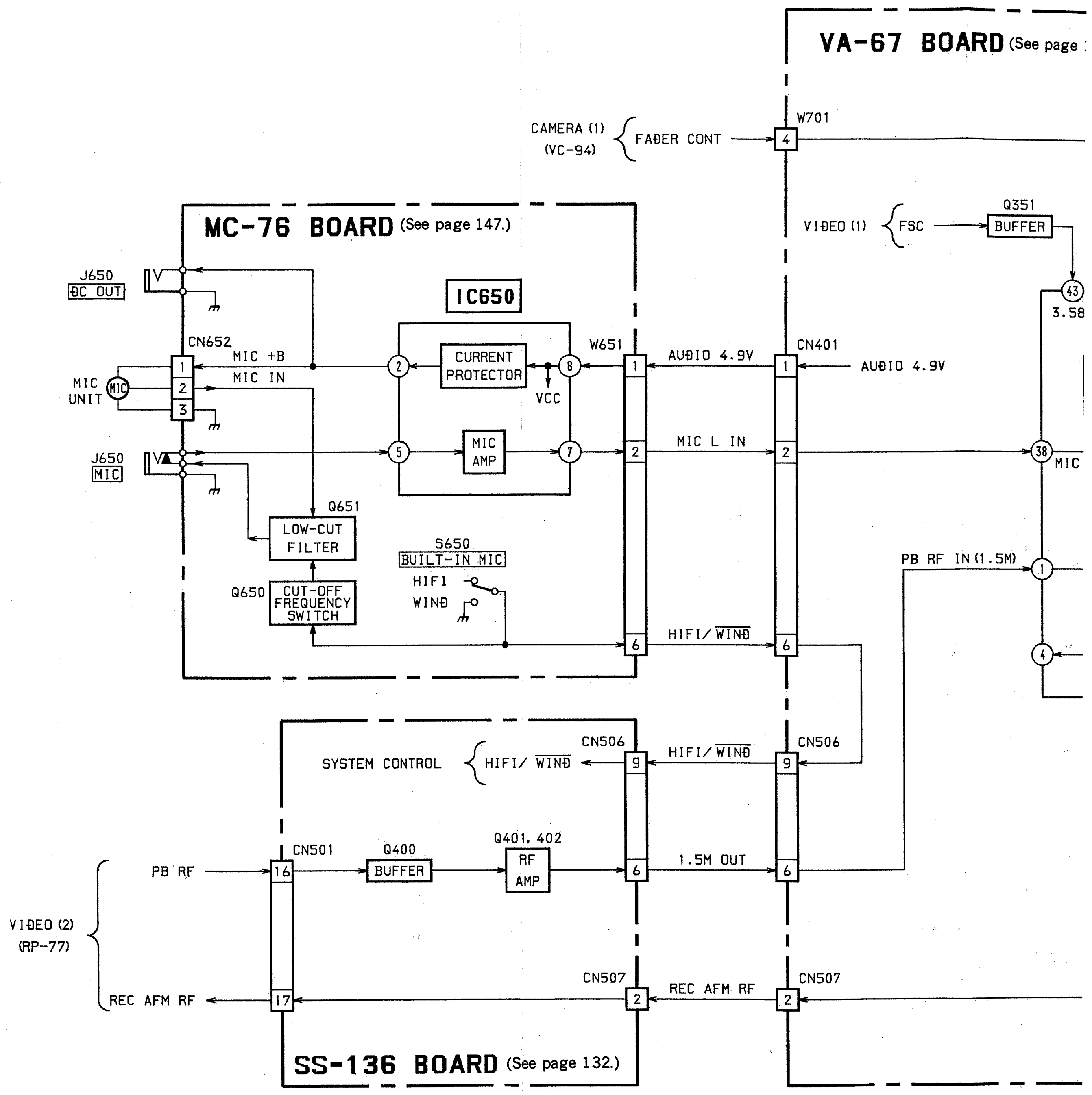
PIN No.	Signal Name	I/O	Function	Connection
60	DRM PG	—	—	—
61	DRM FG	I	DRUM FG input terminal, FRC capture input terminal	IC502 ⑩ Sense Amplifier
62	CAP FG	I	CAPSTAN FG input terminal, FRC capture input terminal	IC502⑫ Sense amplifier
63	MONO/$\overline{\text{ST}}$	—	Not used	—
64	SYNC DET	I	With/Without VIDEO signal recognition signal input	To VIDEO block
65	CAP D/A	O	DA gate pulse output terminal for CAP ERROR output, Servo exclusive output terminal (DA mode)	To capstan lowpass filter
66	DRM D/A	O	DA gate pulse output terminal for DRUM ERROR output, Servo exclusive output terminal (DA mode)	To drum lowpass filter
67	CAP PWM	O	PWM output terminal for CAP ERROR output, Servo excluseive output terminal (PWM mode)	Capstan driver IC503
68	DRM RVS	O	DRUM rotating direction control signal RVS is selected with "H" FWD is selected with "L"	IC503 ③
69	CAP FG	I	External event input terminal to CAP FG input terminal exclusive counter for TAPE COUNTER drive	IC502⑫ sense amplifier
70	MIC JACK MONO/$\overline{\text{ST}}$	I	External MIC Monaural/stereo recognition signal. Monaural is selected with "H"	To AUDIO block
71 72	SS 4.9V			
73	SS GND	—	—	—
74	—	—	Not used	—
75	CAP ON	O	Capstan driver ON control signal	IC504⑬ Capstan driver
76	CAP FWD/$\overline{\text{REV}}$	O	Capstan rotaing direction control signal, FWD is selected with "H", RVS is selected with "L"	IC504⑳ Capstan driver
77	$\overline{\text{RP PB MODE}}$	O	REC/PB mode select signal of RP amplifier and ATF IC	Q516 Ⓑ
78	FE ON	O	Flying erase oscillatio ON/OFF signal. Oscillation is selected with "H"	To RP AMP.
79	JOG VD	O	Artificial VD output terminal input to VIDEO signal in varying speed playback	To VIDEO block
80	RF SWP	O	RF SWP output temrinal	RP block VIDEO/AUDIO block

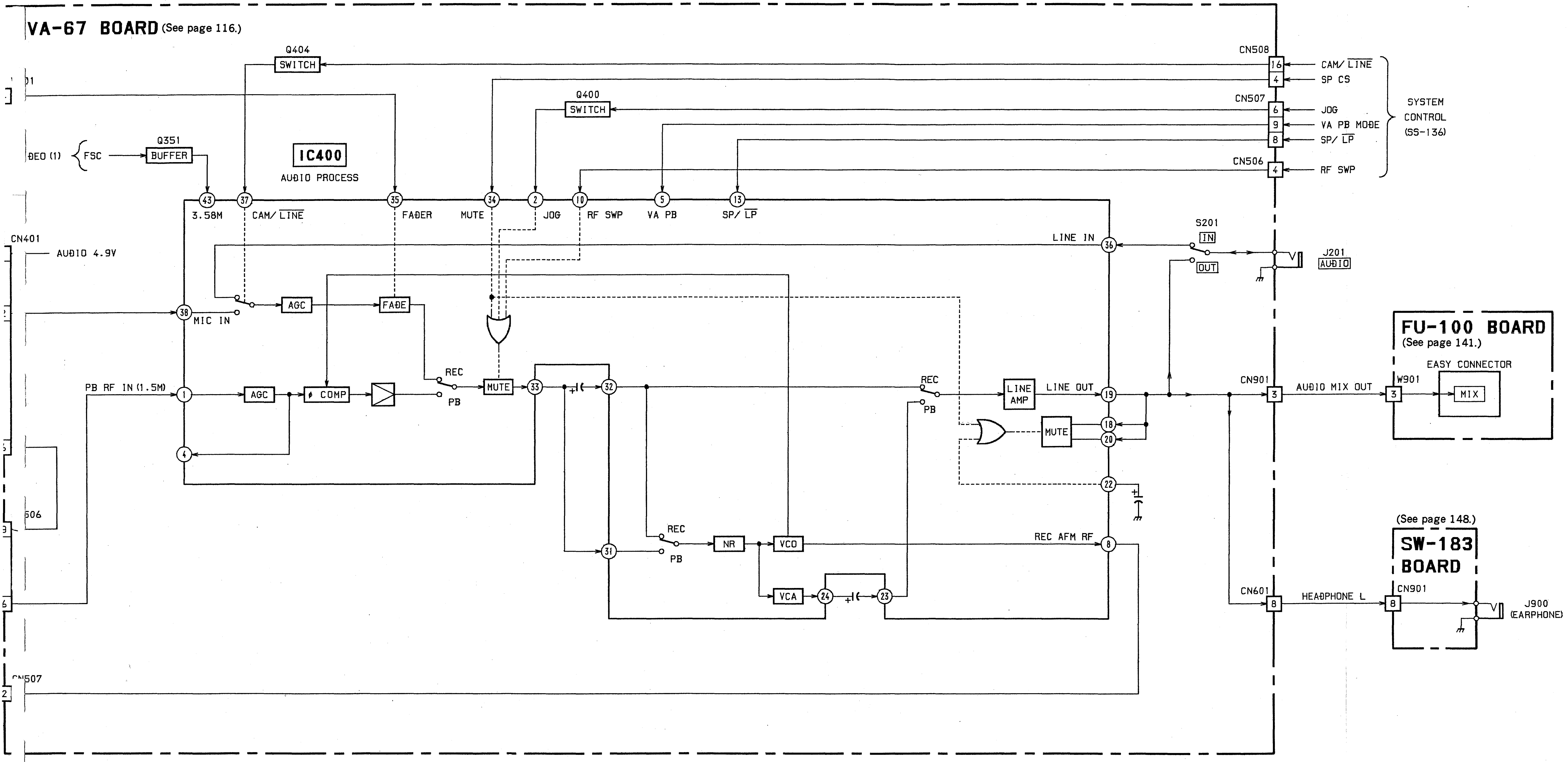
3-12. MODE CONTROL SYSTEM IC TERMINAL FUNCTION DESCRIPTION FU-100BOARD IC501 (μPD75316)

PIN No.	Port Name	Function	I/O	Connection	Signal Name
1	S12	Segment signal output Segment terminal drive to LCD. Not used.	O		
2	S13	Output (Four value output of 0, 1.7, 3.3, 5V)	O		
3	S14	Output (Four value output of 0, 1.7, 3.3, 5V)	O		
4	S15	Output (Four value output of 0, 1.7, 3.3, 5V)	O		
5	S16	Output (Four value output of 0, 1.7, 3.3, 5V)	O		
6	S17	Output (Four value output of 0, 1.7, 3.3, 5V)	O		
7	S18	Output (Four value output of 0, 1.7, 3.3, 5V)	O		
8	S19	Output (Four value output of 0, 1.7, 3.3, 5V)	O		
9	S20	Not used	O		
10	S21	Not used	O		
11	S22	Not used	O		
12	S23	Not used	O		
13	S24/BP0	Chip select signal to video IC (CXA1207) 1V period "L" pulse	O	VA	$\overline{\text{VIDEO CS}}$
14	S25/BP1	Chip select signal to SS board IC501 (CXP80116) 1V period "L" pulse	O	SS IC501	$\overline{\text{MECHA CS}}$
15	S26/BP2	Chip select signal to LCD driver (M34206) 1V period "L" pulse	O	CK	$\overline{\text{LCD CS}}$
16	S27/BP3	Strobe signal for character generator (μPD6451) 1V "H" pulse train.	O	VA	CG STB
17	S28/BP4	Chip select to titler (CF79028) 1V "L" pulse	O		$\overline{\text{TITLE CS}}$
18	S29/BP5	Chip select to sercs remote control (μPD7564) 1V "L" pulse	O	DK	$\overline{\text{REMO CS}}$ REMOTE CONTROL
19	S30/BP6	Chip select to SRAM "H" when using title, Normally, "L"	O		S RAM CS
20	S31/BP7	Chip select to camera μCOM 1V period "H" pulse	O	CAMERA	CAM CS
21	COM0	LCD to common signal output Common terminal drive output Not used.	O		
22	COM1		O		
23	COM2		O		
24	COM3		O		
25	BIAS	Output terminal for outside dividing resistance cut, Power input. Not used.	O		
26	VLC0	Power source for LCD drive, 3V in backup Not used. Power source 0 input terminal	I		
27	VLC1	Power source 1 input terminal	I		
28	VLC2	Power source 2 input terminal	I		
29	P40	SS 5V,VTR 5V power source detection, "H" when VTR power source is turned on.	O	VA	VTR DD ON
30	P41	CAM 5V power source detection	O	CAMERA	$\overline{\text{CAM DD ON}}$
31	P42	Output port to reset each IC when power is turned on.	O	all	$\overline{\text{SYS RESET}}$
32	P43	External tally and internal tally drive port	O	VA and DK	$\overline{\text{TALLY}}$
33	V_{SS}	GND			V_{SS}
34	P50	L active KEY matrix output port	O	all	K OUT0
35	P51		O	all	K OUT1
36	P52		O	all	K OUT2
37	P53		O	all	K OUT3
38	P00/INT4	Clock select to 32K with "L" and to 4.19M with "H" when Battery is turned on, "L" is select.	I	FU	$\overline{\text{BATT IN}}$

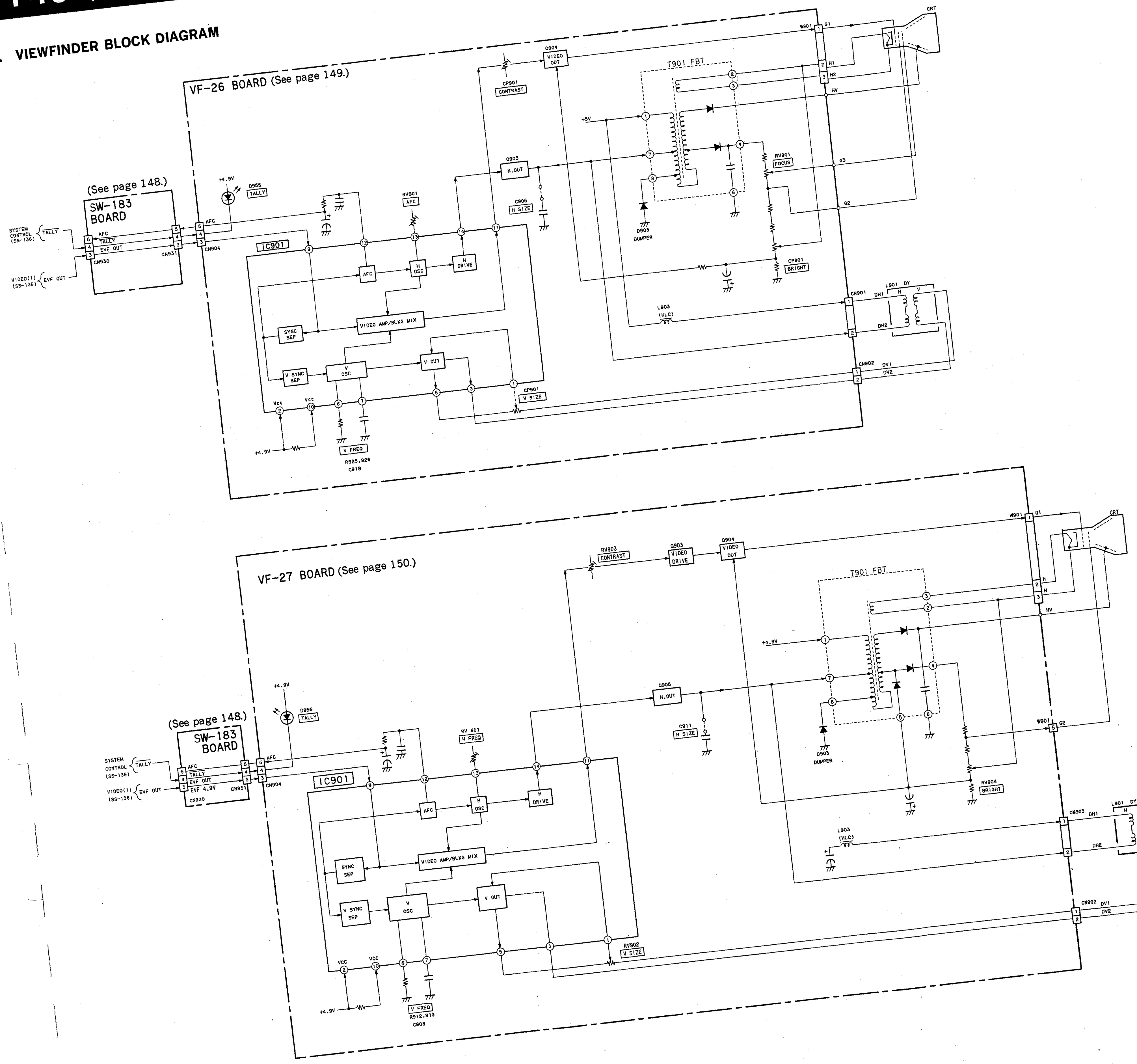
PIN No.	Port Name	Function	I/O	Connection	Signal name
39	P01/$\overline{\text{SCK}}$	Serial clock input-output terminal, Serial clock (2μS) communication	O	all	$\overline{\text{SCK}}$
40	P02/SO/SB0	Serial clock input-output terminal, Serial clock (2μS) communication	O	all	DATA TO SLVE
41	P03/SI/SB1	Serial bus input terminal, Serial clock (2μS) communication	I	all	DATA TO MASTR
42	P10/INT0	(Edge detection vector interruption), System synchronization input port from CXD80116	I	SS IC501	SYSTEM SYNC
43	P11/INT1	(Edge detection vector interruption), Lithium PRE END is selected wiht "L"	I	FU	$\overline{\text{LI PRE END}}$
44	P12/INT2	STABY release input, Release wiht "L" , STA	I	VA	$\overline{\text{LANC PWR ON}}$
45	P13/TIO	E²PROM serial communication data input, EE PROM communiaction KEY matrix OUT is combined.	I	SS IC508	DATA TO MODE
46	P20/PT00	E²PROM serial communication date output, EE PROM communication KEY matrix OUT is combined.	O	SS IC508	KOUT4/DATA TO EE
47	P21	E²PROM serial communication clock output key matrix output, EE PROM communication KEY matrix OUT is combined.	O	SS IC508 VK	KOUT5/SCK EE
48	P22/PCL	Chip select to E²PROM	O	SS IC508	$\overline{\text{EEPROM CS}}$
49	P23/BUZ	Buzzer out	O	SS	BUZZER
50	P30/LCDCL	CAMERA/LINE select output, Camera mode is selected wiht "H", VTR is selected with "L"	O	VA	CAM/$\overline{\text{LINE}}$
51	P31/SYNC	Video mute signal output terminal	O	VA	V MUTE
52	P32	Audio mute signal output terminal	O	VA	A MUTE
53	P33	Chip select to serial/parallel IC. Not used.	O		SP CS
54	V_{DD}	V_E 3V/5V power source terminal		FU	V_{DD}
55	XT1	Sub system clock 32K oscillation terminal	I	FU	XT1
56	XT2			FU	XT2
57	NC			—	NC
58	X1	Main system clock 4.19M oscillation terminal	I	FU	X1
59	X2		I	FU	X2
60	P60/KK0	KEY matrix input terminal 18msec period normally "H" Input-Output is possible by bit. Pull-up from software is possible by 4-bit.	I	all	K IN 0
61	P61/KR1		I	all	K IN 1
62	P62/KR2		I	all	K IN 2
63	P63/KR3		I	all	K IN 3
64	P70/KR4	KEY matrix input terminal. 18msec period normally "H" 4-bit input-Output port. Pull-up from software is possible by 4-bit.	I	all	K IN 4
65	P71/KR5		I	all	K IN 5
66	P72/KR6		I	all	K IN 6
67	P73/KR7		I	all	K IN 7
68	$\overline{\text{RESET}}$	System reset input, Reset input terminal of microcomputer	I		$\overline{\text{RESET}}$
69	S0	Segment signal output terminal not used.	O		
70	S1		O		
71	S2		O		
72	S3		O		
73	S4		O		
74	S5		O		
75	S6	LCD segment signal output terminal. (Four value output of 0, 1.7, 3.3, 5V). Not used.	O		
76	S7		O		
77	S8		O		
78	S9		O		
79	S10		O		
80	S11		O		

3-13. AUDIO BLOCK DIAGRAM

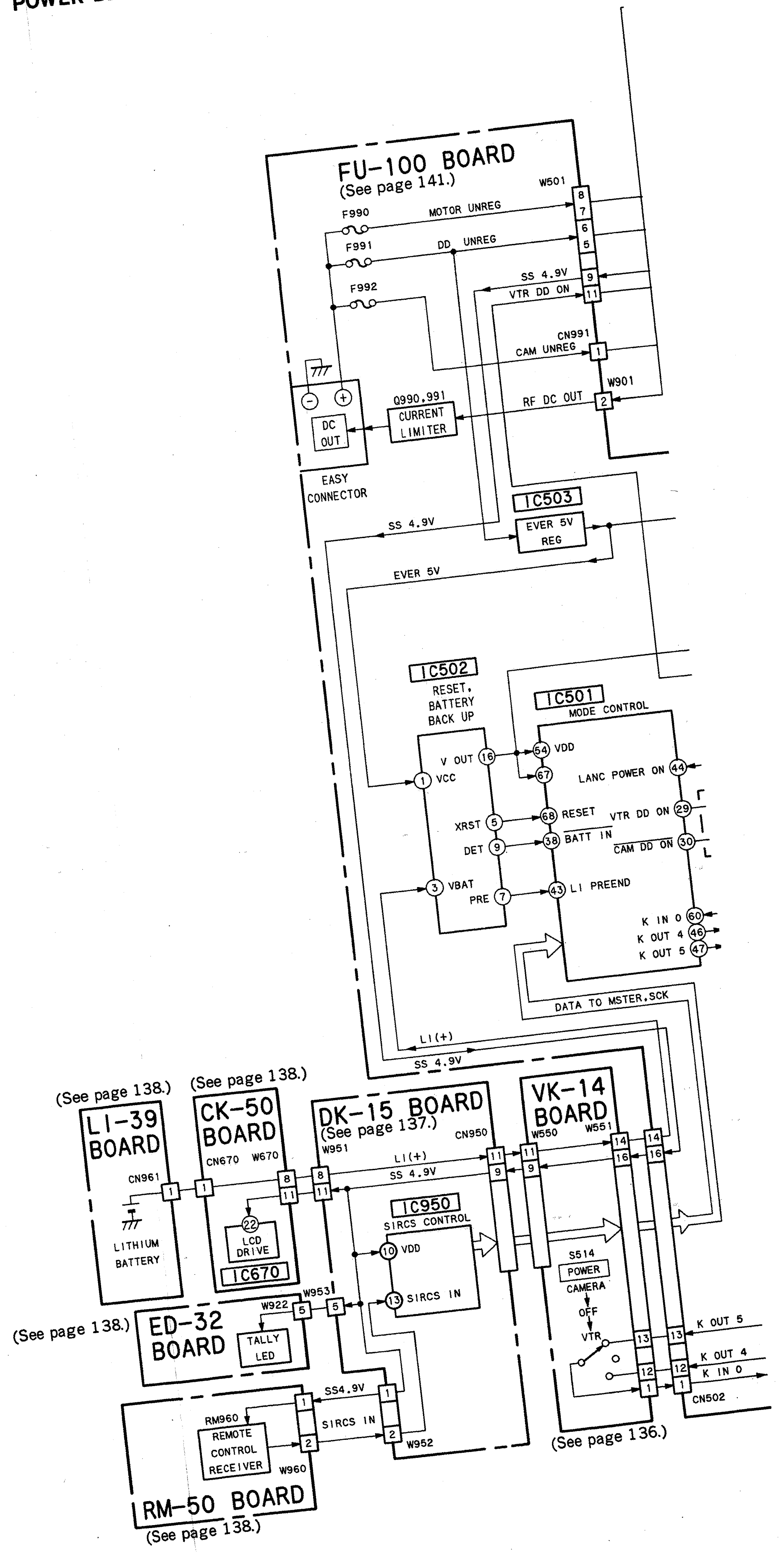

VA-67 BOARD (See page
W701
CAMERA (1) (VC-94)
FADER CONT
4
VIDEO (1)
FSC
Q351
BUFFER
43
3.58
MC-76 BOARD (See page 147.)
J650
DC OUT
IC650
CN652
MIC +B
MIC IN
1
2
3
MIC UNIT
MIC
CURRENT PROTECTOR
VCC
W651
AUDIO 4.9V
CN401
AUDIO 4.9V
J650
MIC
5
MIC AMP
7
MIC L IN
38
MIC
Q651
LOW-CUT FILTER
S650
BUILT-IN MIC
HIFI
WIND
Q650
CUT-OFF FREQUENCY SWITCH
PB RF IN (1.5M)
1
4
6
HIFI/ WIND
CN506
SYSTEM CONTROL
HIFI/ WIND
9
CN501
Q400
BUFFER
Q401, 402
RF AMP
1.5M OUT
PB RF
16
VIDEO (2) (RP-77)
REC AFM RF
17
CN507
2
SS-136 BOARD (See page 132.)

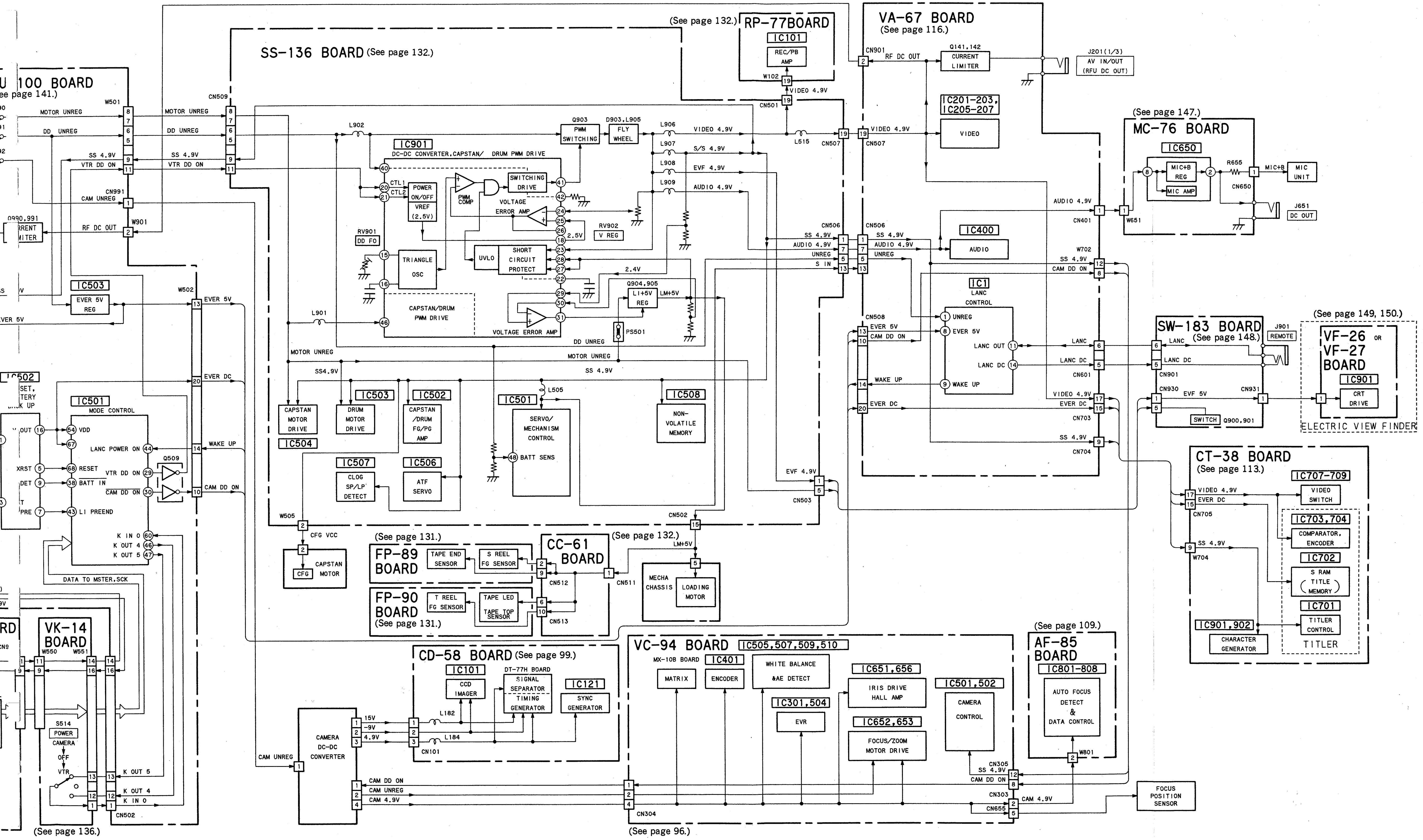

VA-67 BOARD (See page 116.)
Q404
SWITCH
)1
DEO (1)
FSC
Q351
BUFFER
IC400
AUDIO PROCESS
Q400
SWITCH
CN508
16
4
CAM/ $\overline{\text{LINE}}$
SP CS
CN507
6
9
8
JOG
VA PB MODE
SP/ $\overline{\text{LP}}$
SYSTEM CONTROL (SS-136)
CN506
4
RF SWP
43
37
35
34
2
10
5
13
3.58M
CAM/ $\overline{\text{LINE}}$
FADER
MUTE
JOG
RF SWP
VA PB
SP/ $\overline{\text{LP}}$
CN401
AUDIO 4.9V
LINE IN
36
S201
IN
OUT
J201
AUDIO
38
MIC IN
AGC
FADE
PB RF IN (1.5M)
1
AGC
ϕ COMP
REC
PB
MUTE
33
32
REC
PB
LINE AMP
LINE OUT
19
18
20
MUTE
22
CN901
3
AUDIO MIX OUT
FU-100 BOARD
(See page 141.)
EASY CONNECTOR
W901
3
MIX
4
506
REC
PB
31
NR
VCO
REC AFM RF
8
VCA
24
23
(See page 148.)
SW-183 BOARD
CN601
8
HEADPHONE L
CN901
8
J900
(EARPHONE)
CN507
2
6
3
5
2

3-14. VIEWFINDER BLOCK DIAGRAM


VF-26 BOARD (See page 149.)
(See page 148.)
SW-183 BOARD
SYSTEM CONTROL (SS-136)
TALLY
VIDEO(1) (SS-136)
EVF OUT
AFC
EVF 4.9V
CN930
CN931
CN904
+4.9V
D955 TALLY
IC901
AFC
H OSC
H DRIVE
VIDEO AMP/BLKG MIX
SYNC SEP
V SYNC SEP
V OSC
V OUT
Vcc
RV901 AFC
C905 H SIZE
Q903 H.OUT
Q904 VIDEO OUT
CP901 CONTRAST
T901 FBT
+5V
D903 DUMPER
RV901 FOCUS
CP901 BRIGHT
L903 (HLC)
CP901 V SIZE
V FREQ
R925,926 C919
W901
G1
H1
H2
HV
G3
G2
CN901
DH1
DH2
L901 DY
H
V
CN902
DV1
DV2
CRT
VF-27 BOARD (See page 150.)
RV903 CONTRAST
Q903 VIDEO DRIVE
Q904 VIDEO OUT
Q905 H.OUT
C911 H SIZE
RV 901 H FREQ
RV904 BRIGHT
RV902 V SIZE
V FREQ
R912,913 C908
CN903
+4.9V

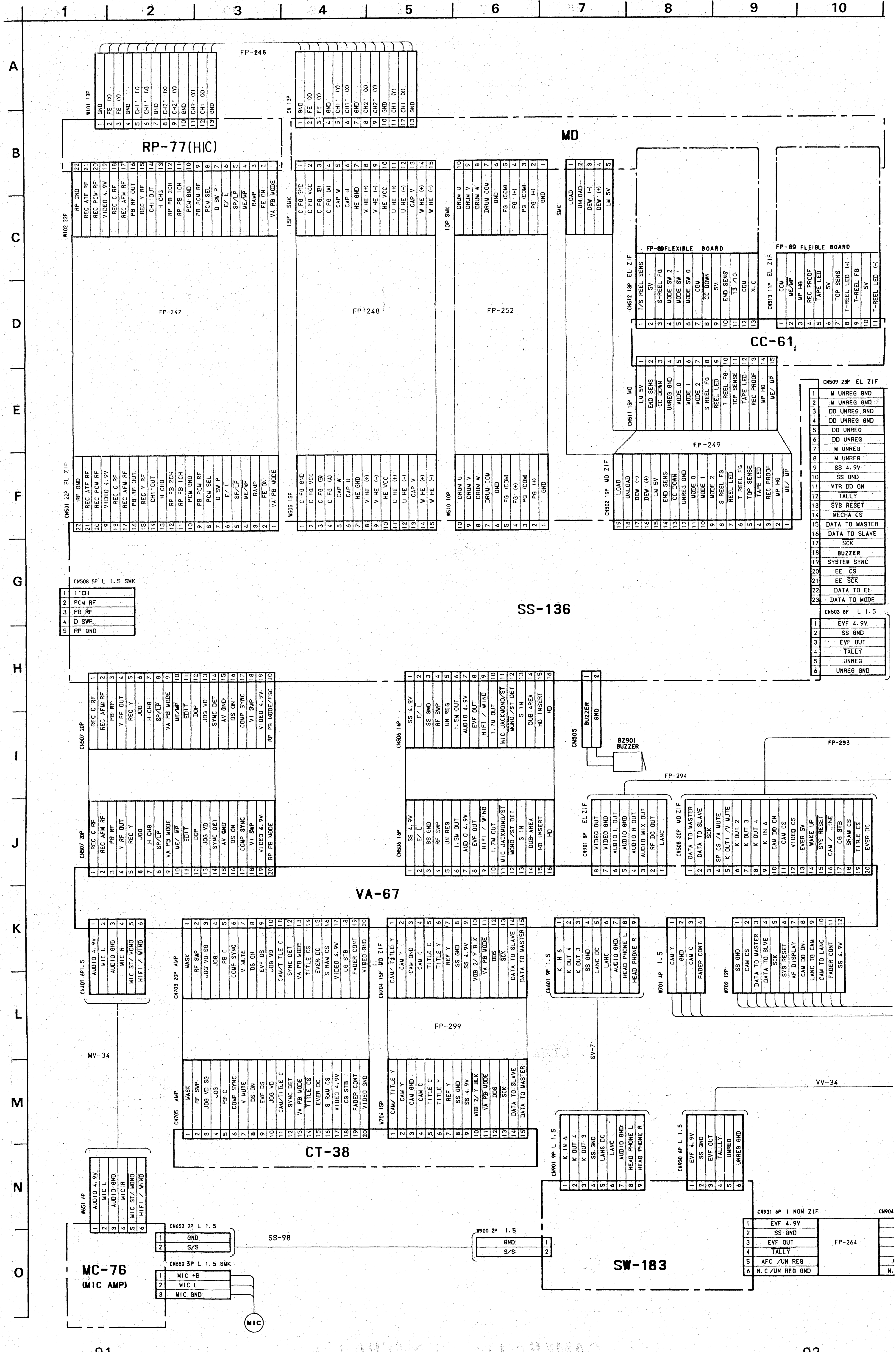
3-15. POWER BLOCK DIAGRAM


FU-100 BOARD
(See page 141.)
W501
F990
MOTOR UNREG
F991
DD UNREG
F992
SS 4.9V
VTR DD ON
CN991
CAM UNREG
W901
RF DC OUT
Q990,991 CURRENT LIMITER
DC OUT
EASY CONNECTOR
IC503
EVER 5V REG
SS 4.9V
EVER 5V
IC502
RESET, BATTERY BACK UP
V OUT
VCC
XRST
DET
VBAT
PRE
IC501
MODE CONTROL
VDD
LANC POWER ON
RESET
VTR DD ON
BATT IN
CAM DD ON
LI PREEND
K IN 0
K OUT 4
K OUT 5
DATA TO MSTER.SCK
LI(+)
SS 4.9V
(See page 138.)
LI-39 BOARD
CN961
LITHIUM BATTERY
(See page 138.)
CK-50 BOARD
CN670
W670
LCD DRIVE
IC670
DK-15 BOARD
(See page 137.)
W951
CN950
LI(+)
SS 4.9V
IC950
SIRCS CONTROL
VDD
SIRCS IN
VK-14 BOARD
W550
W551
S514
POWER
CAMERA
OFF
VTR
K OUT 5
K OUT 4
K IN 0
CN502
(See page 136.)
(See page 138.)
ED-32 BOARD
W922
TALLY LED
W953
SS4.9V
SIRCS IN
W952
RM960
REMOTE CONTROL RECEIVER
W960
RM-50 BOARD
(See page 138.)

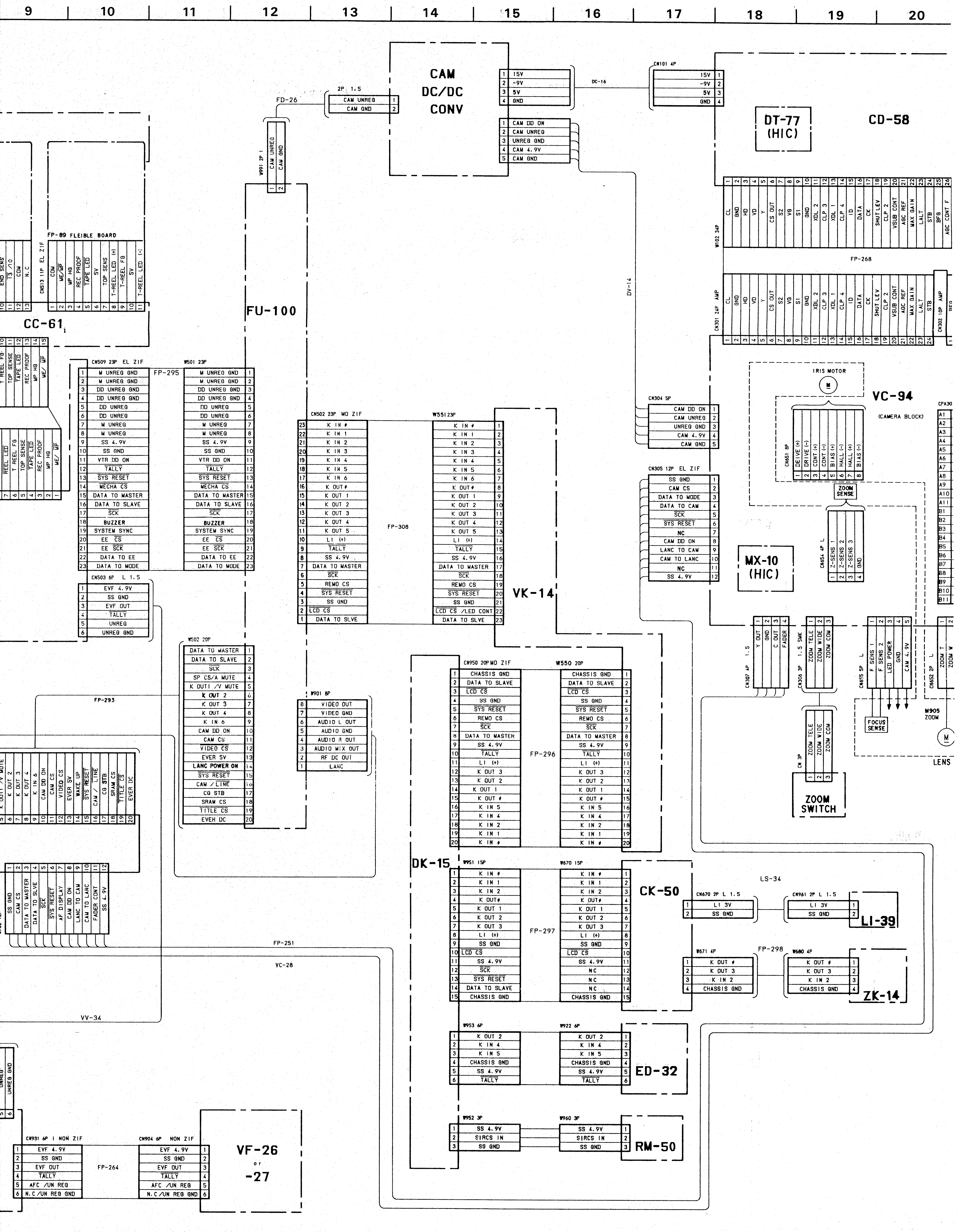

SS-136 BOARD (See page 132.)
RP-77BOARD (See page 132.)
IC101
REC/PB AMP
VA-67 BOARD (See page 116.)
Q141,142 CURRENT LIMITER
J201(1/3) AV IN/OUT (RFU DC OUT)
RF DC OUT
IC201-203, IC205-207
VIDEO
MC-76 BOARD (See page 147.)
IC650
MIC+B REG
MIC AMP
R655
MIC UNIT
J651 DC OUT
CN650
W651
IC400
AUDIO
IC1 LANC CONTROL
UNREG
EVER 5V
LANC OUT
LANC DC
WAKE UP
SW-183 BOARD (See page 148.)
J901 REMOTE
SWITCH Q900,901
VF-26 OR VF-27 BOARD (See page 149, 150.)
IC901 CRT DRIVE
ELECTRIC VIEW FINDER
CT-38 BOARD (See page 113.)
IC707-709 VIDEO SWITCH
IC703,704 COMPARATOR, ENCODER
IC702 S RAM (TITLE MEMORY)
IC701 TITLER CONTROL
IC901,902 CHARACTER GENERATOR
TITLER
U 100 BOARD (See page 141.)
MOTOR UNREG
DD UNREG
SS 4.9V
VTR DD ON
CAM UNREG
RF DC OUT
IC503 EVER 5V REG
IC502
IC501 MODE CONTROL
VDD
LANC POWER ON
RESET
VTR DD ON
BATT IN
CAM DD ON
LI PREEND
K IN 0
K OUT 4
K OUT 5
Q509
DATA TO MSTER.SCK
IC901 DC-DC CONVERTER.CAPSTAN/ DRUM PWM DRIVE
POWER ON/OFF
VREF (2.5V)
PWM COMP
SWITCHING DRIVE
VOLTAGE ERROR AMP
TRIANGLE OSC
UVLO
SHORT CIRCUIT PROTECT
CAPSTAN/DRUM PWM DRIVE
VOLTAGE ERROR AMP
RV901 DD FO
RV902 V REG
Q903 PWM SWITCHING
D903,L905 FLY WHEEL
Q904,905 LI+5V REG
PS501
L902
L901
L906
L907
L908
L909
L515
VIDEO 4.9V
S/S 4.9V
EVF 4.9V
AUDIO 4.9V
CAPSTAN MOTOR DRIVE
IC504
IC503 DRUM MOTOR DRIVE
IC502 CAPSTAN /DRUM FG/PG AMP
IC501 SERVO/ MECHANISM CONTROL
BATT SENS
IC508 NON-VOLATILE MEMORY
IC507 CLOG SP/LP DETECT
IC506 ATF SERVO
CAPSTAN MOTOR CFG
CFG VCC
FP-89 BOARD (See page 131.)
TAPE END SENSOR
S REEL FG SENSOR
FP-90 BOARD (See page 131.)
T REEL FG SENSOR
TAPE LED TAPE TOP SENSOR
CC-61 BOARD (See page 132.)
MECHA CHASSIS
LOADING MOTOR
VK-14 BOARD (See page 136.)
S514 POWER CAMERA OFF VTR
CD-58 BOARD (See page 99.)
CAMERA DC-DC CONVERTER
IC101 CCD IMAGER
DT-77H BOARD SIGNAL SEPARATOR TIMING GENERATOR
IC121 SYNC GENERATOR
15V
-9V
4.9V
L182
L184
VC-94 BOARD
IC505,507,509,510
MX-10B BOARD
MATRIX
IC401 ENCODER
WHITE BALANCE &AE DETECT
IC301,504 EVR
IC651,656 IRIS DRIVE HALL AMP
IC652,653 FOCUS/ZOOM MOTOR DRIVE
IC501,502 CAMERA CONTROL
AF-85 BOARD (See page 109.)
IC801-808 AUTO FOCUS DETECT & DATA CONTROL
FOCUS POSITION SENSOR
CAM DD ON
CAM UNREG
CAM 4.9V
CN304
(See page 96.)

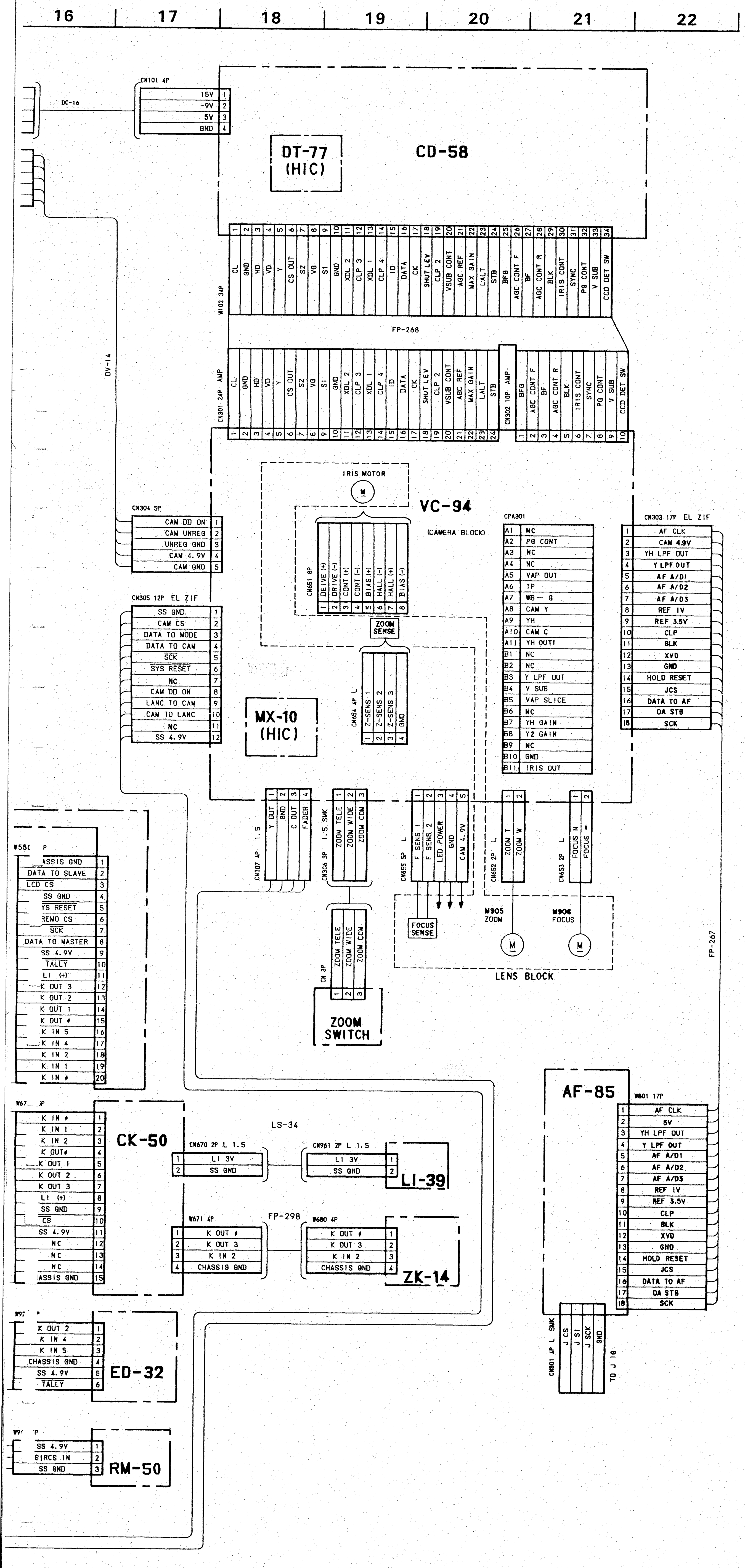
SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



RP-77(HIC)
MD
CC-61
SS-136
VA-67
CT-38
SW-183
MC-76
(MIC AMP)
MIC
W101 13P
CN 13P
W102 22P
1SP SMK
10P SMK
SMK
CN501 22P EL ZIF
W505 15P
W510 10P
CN502 19P MD ZIF
CN511 15P MD
CN512 13P EL ZIF
CN513 11P EL ZIF
FP-89 FLEXIBLE BOARD
FP-89 FLEIBLE BOARD
CN509 23P EL ZIF
CN503 6P L 1.5
CN508 5P L 1.5 SMK
CN507 20P
CN506 16P
CN505
BZ901
BUZZER
CN901 8P EL ZIF
CN508 20P MD ZIF
CN401 6P1.5
CN703 20P AMP
CN704 15P MD ZIF
CN601 9P L 1.5
W701 4P 1.5
W702 12P
CN705 AMP
W704 15P
CN901 9P L 1.5
CN930 6P L 1.5
CN931 6P I NON ZIF
CN904
W651 6P
CN652 2P L 1.5
CN650 3P L 1.5 SMK
W900 2P 1.5
FP-246
FP-247
FP-248
FP-252
FP-249
FP-293
FP-294
FP-299
FP-264
MV-34
SV-71
VV-34
SS-98


9
10
11
12
13
14
15
16
17
18
19
20
CAM DC/DC CONV
2P 1.5
CAM UNREG
CAM GND
FD-26
W991 2P I
DC-16
CN101 4P
15V
-9V
5V
GND
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
DT-77 (HIC)
CD-58
W102 34P
FP-268
CN301 24P AMP
CN302 10P AMP
CL
GND
HD
VD
Y
CS OUT
S2
VG
S1
XDL 2
CLP 3
XDL 1
CLP 4
ID
DATA
CK
SHUT LEV
CLP 2
VSUB CONT
AGC REF
MAX GAIN
LALT
STB
BFG
AGC CONT F
DV-14
FP-89 FLEIBLE BOARD
CN513 11P EL ZIF
CC-61
FU-100
CN509 23P EL ZIF
FP-295
W501 23P
CN503 6P L 1.5
CN502 23P MO ZIF
W551 23P
FP-308
VK-14
W502 20P
FP-293
W901 8P
CN304 5P
CN305 12P EL ZIF
VC-94
(CAMERA BLOCK)
IRIS MOTOR
CN651 8P
ZOOM SENSE
CN654 4P L
MX-10 (HIC)
CPA30
CN307 4P 1.5
CN306 3P 1.5 SMK
CN655 5P L
CN652 2P L
FOCUS SENSE
W905 ZOOM
LENS
CN 3P
ZOOM SWITCH
CN950 20P MO ZIF
W550 20P
FP-296
DK-15
W951 15P
W670 15P
FP-297
CK-50
CN670 2P L 1.5
CN961 2P L 1.5
LI-39
LS-34
W671 4P
FP-298
W680 4P
ZK-14
W953 6P
W922 6P
ED-32
W952 3P
W960 3P
RM-50
FP-251
VC-28
VV-34
CN931 6P I NON ZIF
CN904 6P NON ZIF
FP-264
VF-26 or -27


16
17
18
19
20
21
22
CD-58
DT-77 (HIC)
CN101 4P
15V
-9V
5V
GND
DC-16
DV-14
W102 34P
FP-268
CN301 24P AMP
CN302 10P AMP
VC-94
(CAMERA BLOCK)
IRIS MOTOR
CN651 8P
DEIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (-)
HALL (+)
BIAS (-)
ZOOM SENSE
CN654 4P L
Z-SENS 1
Z-SENS 2
Z-SENS 3
GND
MX-10 (HIC)
CN304 5P
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
CN305 12P EL ZIF
SS GND
CAM CS
DATA TO MODE
DATA TO CAM
SCK
SYS RESET
NC
CAM DD ON
LANC TO CAM
CAM TO LANC
NC
SS 4.9V
CPA301
CN303 17P EL ZIF
AF CLK
CAM 4.9V
YH LPF OUT
Y LPF OUT
AF A/D1
AF A/D2
AF A/D3
REF 1V
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
JCS
DATA TO AF
DA STB
SCK
CN307 4P 1.5
Y OUT
GND
C OUT
FADER
CN306 3P 1.5 SMK
ZOOM TELE
ZOOM WIDE
ZOOM COM
CN655 5P L
F SENS 1
F SENS 2
LED POWER
GND
CAM 4.9V
CN652 2P L
ZOOM T
ZOOM W
CN653 2P L
FOCUS N
FOCUS +
FOCUS SENSE
M905 ZOOM
M906 FOCUS
LENS BLOCK
FP-267
CN 3P
ZOOM SWITCH
AF-85
W801 17P
CN801 4P L SMK
J CS
J S1
J SCK
GND
TO J 18
CK-50
LS-34
CN670 2P L 1.5
LI 3V
SS GND
CN961 2P L 1.5
LI-39
FP-298
W671 4P
W680 4P
K OUT #
K OUT 3
K IN 2
CHASSIS GND
ZK-14
ED-32
RM-50
SS 4.9V
SIRCS IN
SS GND
TALLY

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For printed wiring boards.**
- ● : Through hole.
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side. *
- Circled numbers refer to waveforms. *

- **For schematic diagram.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/10W or 1/16W unless otherwise noted.
  kΩ: 1000Ω, MΩ: 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repair. *
- ━ : B + Line *
- Circled numbers refer to waveforms. *
- ⇨ : IN/OUT direction of B (+, −) line. *

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

* Indicated by the color red.

- For voltag
- Voltage ar
  (1) Samp
  (2) Volt

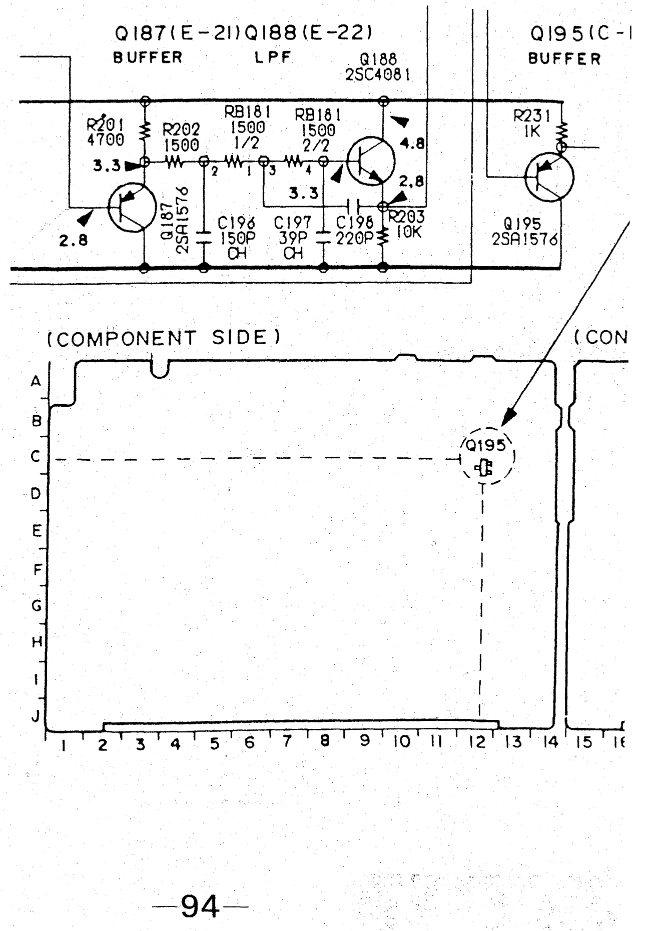
1. Connecti

2. Adjust th
the outpu
can be ob

- For volta
- Voltages
- Readings
- Readings
- Voltage
  productic

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.


Q187(E-21)Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-
BUFFER
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
R231
1K
3.3
4.8
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195
2SA1576
(COMPONENT SIDE)
(CON
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Q195

G BOARDS AND SCHEMATIC DIAGRAMS

OMMON FOR PRINTED WIRING BOARDS DIAGRAMS.

, the necessary note is printed in each block.)

rds.

e side which enables seeing.
ear side. *
r to waveforms. *

n.
ng chip parts.
tached after removal of chip.
eat the minus side of tantalum capacitor,
by the heat.
hms, 1/10W or 1/16W unless otherwise noted.
00kΩ.

F unless otherwise noted. pF : μμF.
ndicated except for electrolytics and

stable resistors have characteristic curve B,
d.
resistor.
r.
ion.
onent.
r repair. *

r to waveforms. *
tion of B (+, –) line. *

tl-
t-
rt

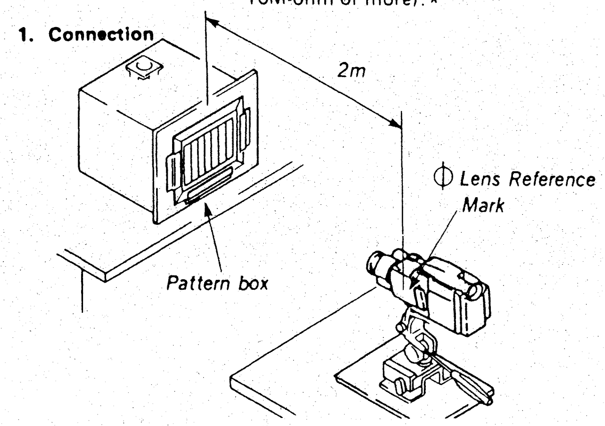
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

ts by refer-
se include

olor red.

- **For voltage and waveforms. (CAMERA REC mode)**
- Voltage and waveform measuring conditions: *
  - (1) Sample object: Pattern box color bars. *
  - (2) Voltage values: Relative to ground, measured with a DC digital multimeter (impedance 10M-ohm or more). *

1. **Connection**


2m
Lens Reference Mark
Pattern box

2. **Adjust the zooming of camera and the tripod so that the output waveform of Fig. a and the picture of Fig. b can be obtain.**

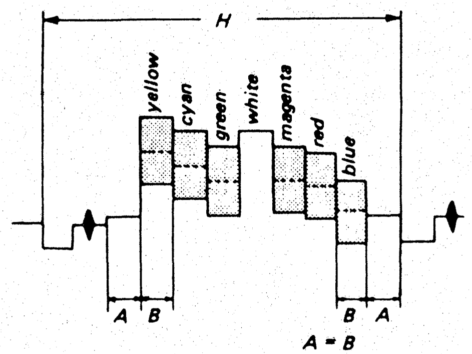

H
yellow
cyan
green
white
magenta
red
blue
A
B
B
A
A = B

Fig. a Video output waveform.

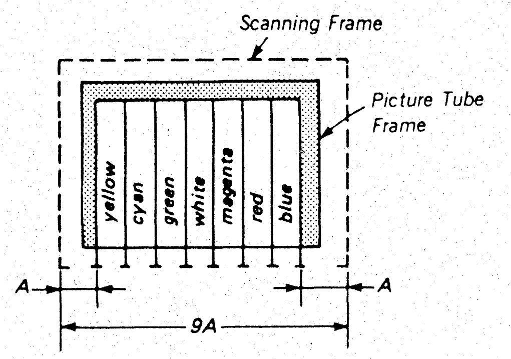
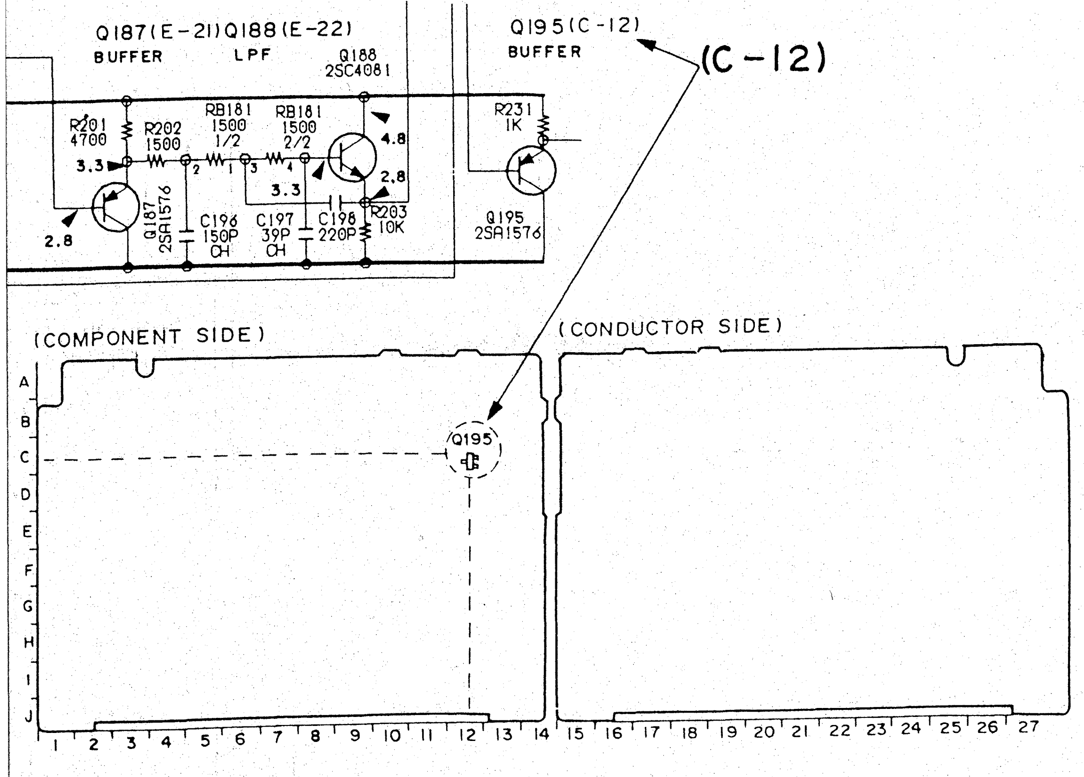

Scanning Frame
Picture Tube Frame
yellow
cyan
green
white
magenta
red
blue
A
A
9A

Fig. b Picture of TV monitor screen

- **For voltage and waveforms. (REC/PB mode)**
- Voltages are dc between ground and measurement points. *
- Readings are taken with a color-bar signal input. *
- Readings are taken with a digital multimeter (DC10MΩ). *
- Voltage variations may be noted due to normal production tolerances. *

LOCATION]

l, the mounted locations of the sistor, diodes) are indicated in red as les to find the location on the board


Q187(E-21)Q188(E-22)
BUFFER
LPF
Q188
2SC4081
Q195(C-12)
BUFFER
(C-12)
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
3.3
4.8
2.8
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
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27

Precautions for replacement of CCD imager block.

- With a pair of IC101 (CCD imager) on the CD-58 complete board and IC001 (corrector ROM) on the DT-77 complete board, it is used a repair part of the CCD imager block.
  Since corrector ROM IC is manufactured to match the CCD imager, replacement of a single unit of the CCD imager corrector ROM cannot be allowed.
- When both a CCD imager and the corrector ROM, replace both the CCD imager and the corrector ROM, when a corrector ROM is not mounted on the service set, install a corrector ROM which is supplied anew.
- IC101 (CCD imager) is not mounted on the CD-58 complete board to be supplied as a repair part, and IC001 (corrector ROM) is not mounted on the DT-77 complete board to be supplied as a repair part. When the respective boards are replaced, remove the respective ICs from the old boards and install them to the new once respectively.
- After the CCD imager block has been replaced, perform the entire adjustments of the camera section.
- CCD imager is structurally in case of being broken down by static electricity.
  For this reason, take care to handle it as well as MOS IC. Moreover, care should be taken for dust not to be stuck on the light reseiving section and for strong light not to get into there.

CD-58 (CCD IMAGER), VC-94 (CAMERA PROCESS, ZOOM/FOCUS) SCHEMATIC DIAGRAM

—Ref. No. CD-58 and, VC-94 BOARDS : 1000 series—

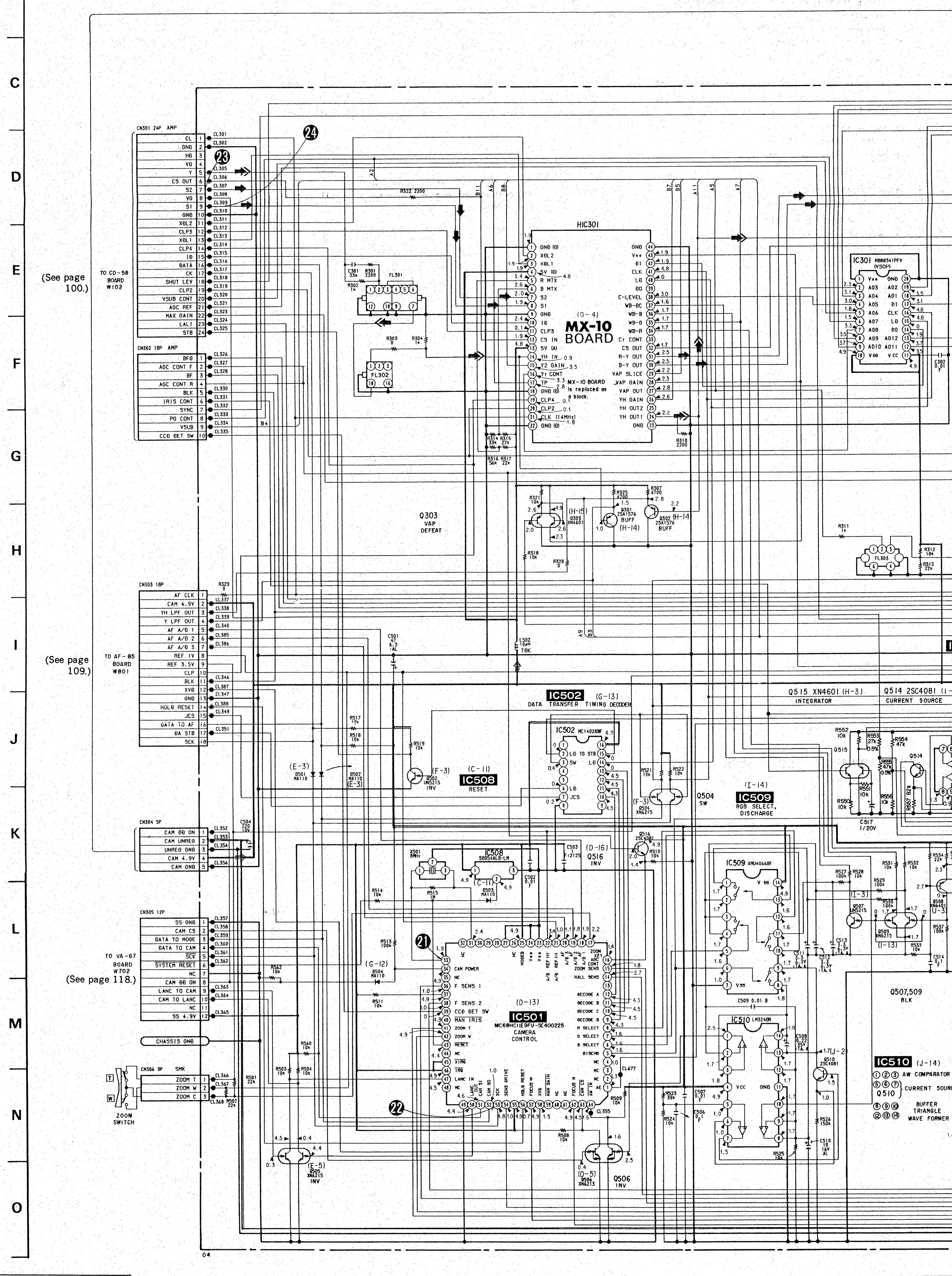
- Signal path

	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	➡»	➡»»

Be sure to always read "Precautions for replacement of CCD imager block" in page 95 when replacing the CD-58 board, complete, DT-77 board, complete and CCD imager block (IC101 on the CD-58 board and IC001 on the DT-77 board).

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

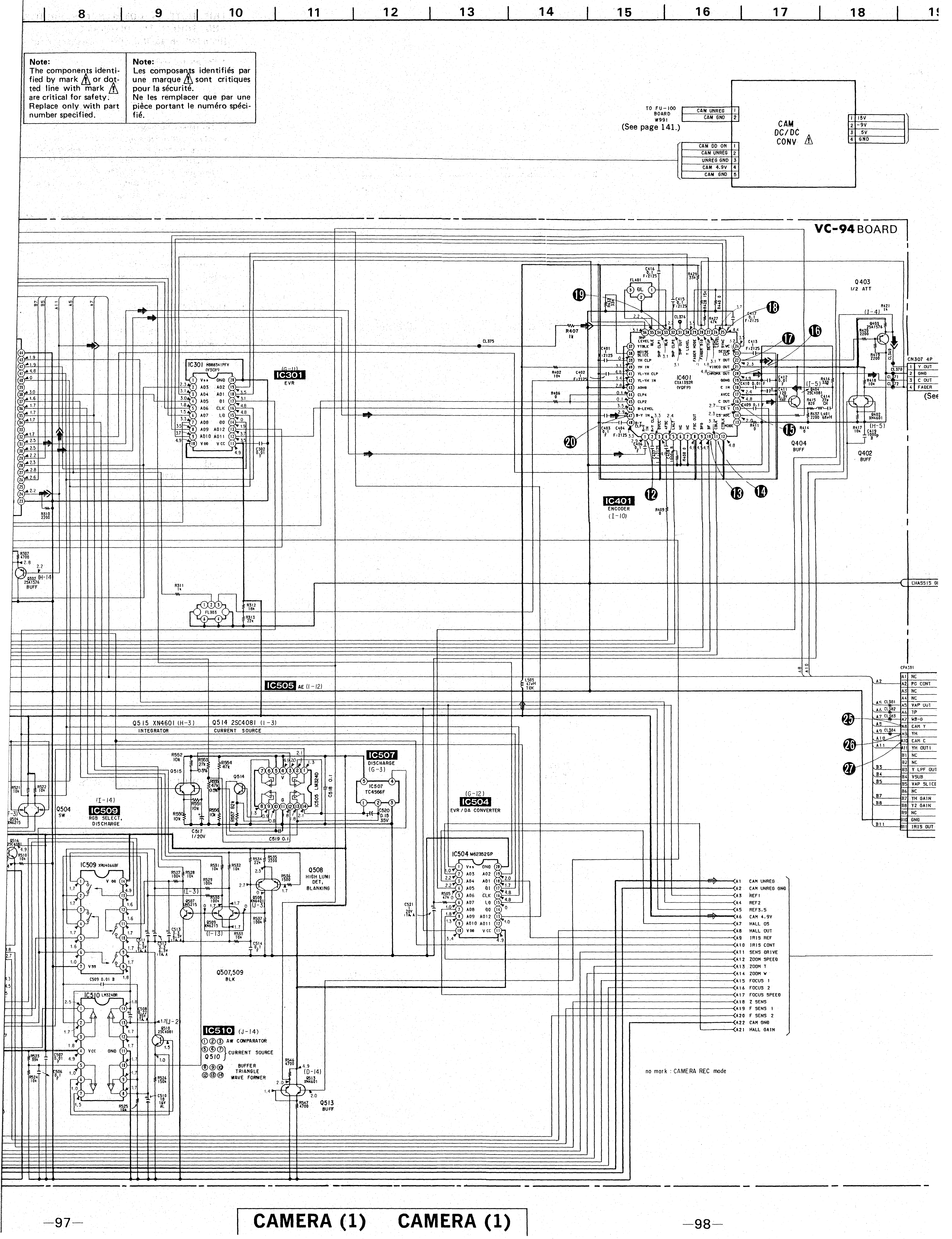
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.



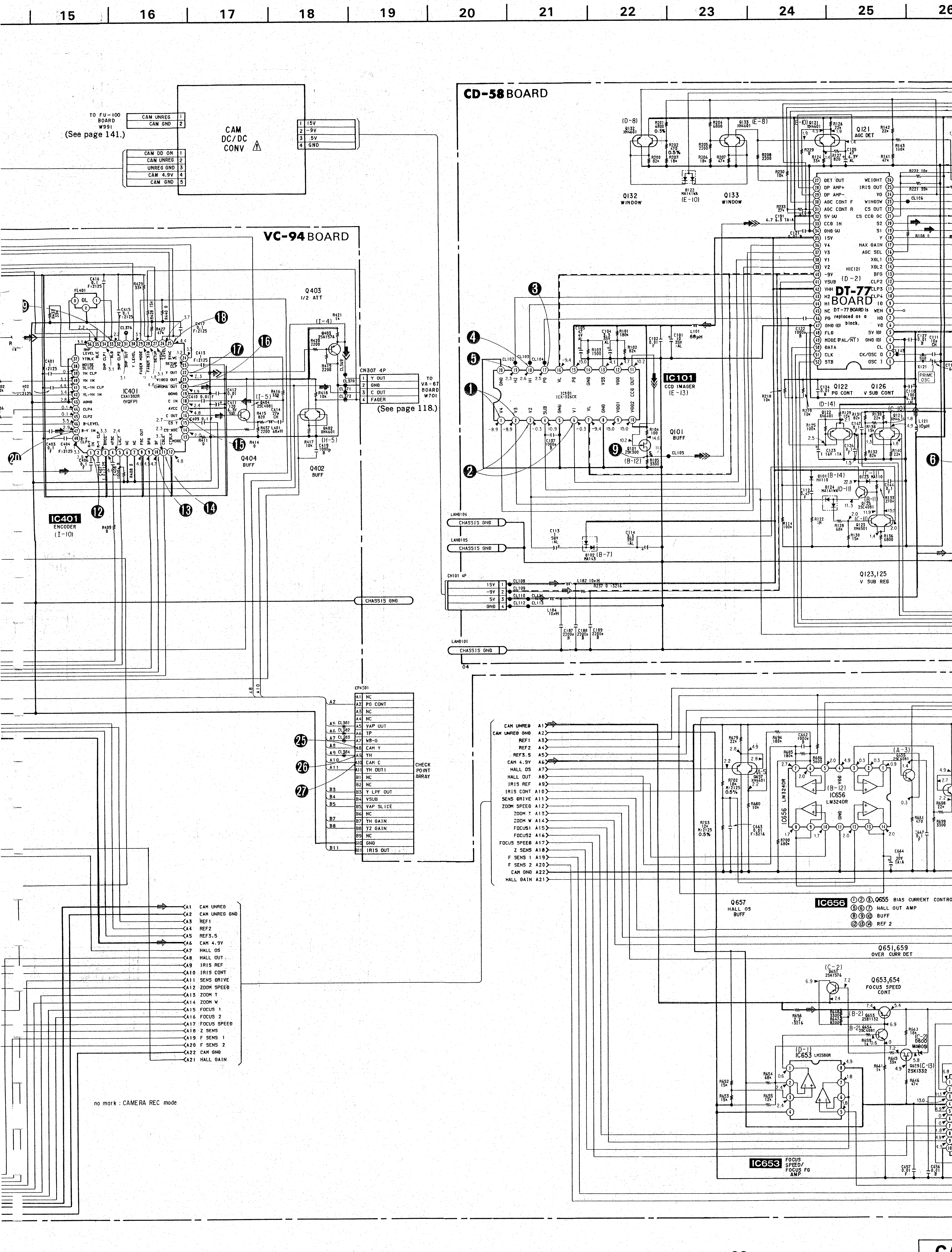
1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CN301 24P AMP
CL
GND
HD
VD
Y
CS OUT
S2
VG
S1
GND
XOL2
CLP3
XOL1
CLP4
ID
DATA
CK
SHUT LEV
CLP2
VSUB CONT
AGC REF
MAX GAIN
LALT
STB
(See page 100.)
TO CD-58 BOARD W102
CN302 10P AMP
BFG
AGC CONT F
BF
AGC CONT R
BLK
IRIS CONT
SYNC
PG CONT
VSUB
CCD DET SW
CN303 18P
AF CLK
CAM 4.9V
YH LPF OUT
Y LPF OUT
AF A/D 1
AF A/D 2
AF A/D 3
REF 1V
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
JCS
DATA TO AF
DA STB
SCK
(See page 109.)
TO AF-85 BOARD W801
CN304 5P
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
CN305 12P
SS GND
CAM CS
DATA TO MODE
DATA TO CAM
SCK
SYSTEM RESET
NC
CAM DD ON
LANC TO CAM
CAM TO LANC
NC
SS 4.9V
TO VA-67 BOARD W702
(See page 118.)
CHASSIS GND
CN306 3P SMK
ZOOM T
ZOOM W
ZOOM C
ZOOM SWITCH
HIC301
MX-10 BOARD
(G-4)
MX-10 BOARD is replaced as a block.
FL301
FL302
FL303
Q303 VAP DEFEAT
Q301 2SA1576 BUFF (H-14)
Q302 2SA1576 BUFF (H-14)
IC301 MB88341PFV (V50P)
IC502 (G-13) DATA TRANSFER TIMING DECODER
IC502 MC14028BF
IC508 (C-11) RESET
IC508 S8054ALB-LM
Q502 UN5215 INV (F-3)
D501 MA110 (E-3)
D502 MA110 (E-3)
X501 8MHz
D503 MA110
D504 MA110
Q516 2SC4081 INV (D-16)
Q504 XN6215 SW (F-3)
IC509 (I-14) RGB SELECT, DISCHARGE
IC509 XRU4066BF
IC510 LM324DR
IC501 (D-13) MC68HC11E9FU-SC400225 CAMERA CONTROL
Q505 XN6215 INV (E-5)
Q506 XN6213 INV (D-5)
Q515 XN4601 (H-3) INTEGRATOR
Q514 2SC4081 CURRENT SOURCE
Q507,509 BLK
Q510 2SC4081
IC510 (J-14)
①②③ AW COMPARATOR
⑤⑥⑦ Q510 CURRENT SOURCE
⑧⑨⑩ ⑫⑬⑭ BUFFER TRIANGLE WAVE FORMER
㉑
㉒
㉓
㉔

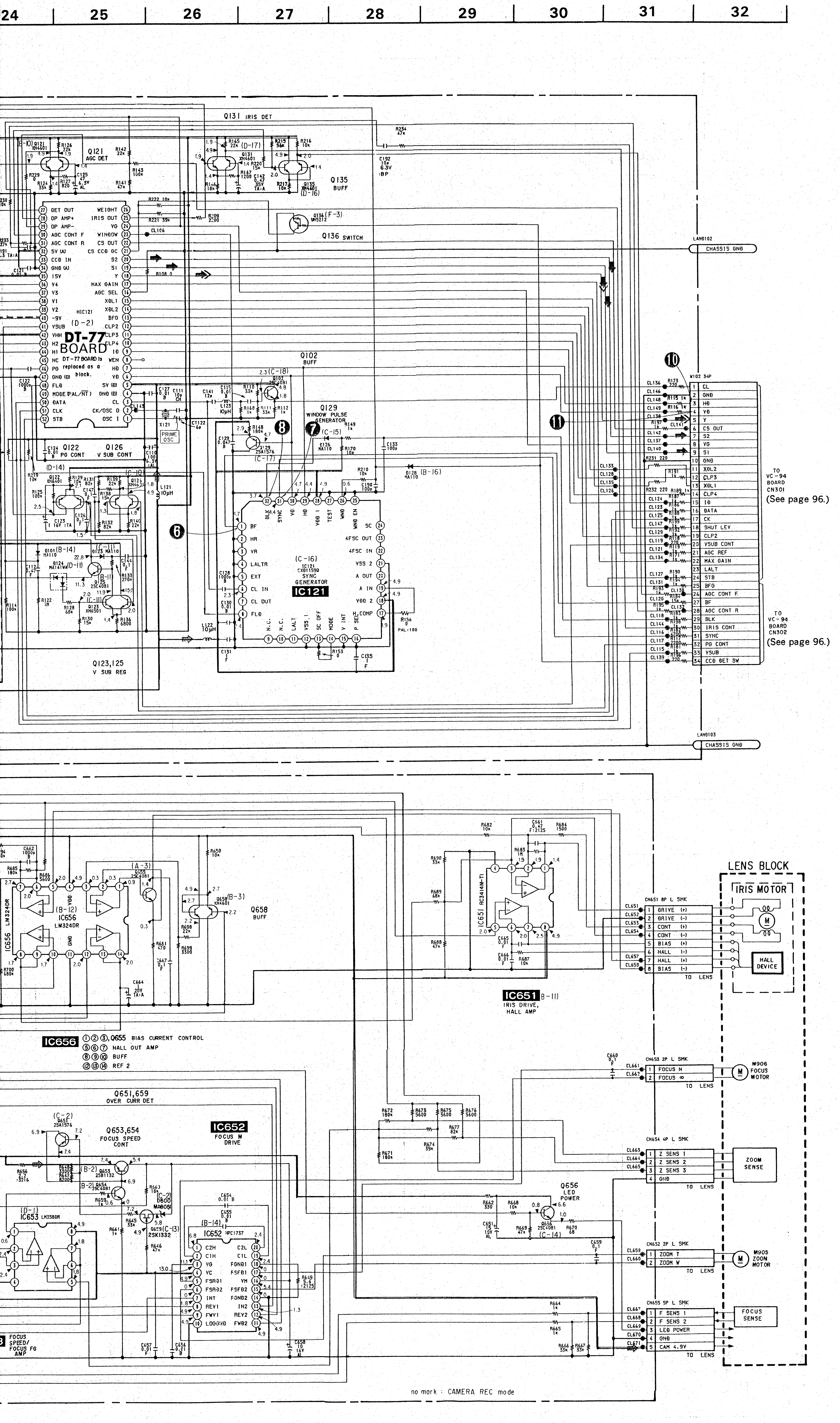
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.



8
9
10
11
12
13
14
15
16
17
18
TO FU-100 BOARD W991
(See page 141.)
CAM UNREG
CAM GND
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
CAM DC/DC CONV ⚠
15V
-9V
5V
GND
VC-94 BOARD
IC301 MB88341PFV (VSOP)
IC301 (G-11) EVR
IC401 CXA1392R (VQFP)
IC401 ENCODER (I-10)
Q403 2SA1576 1/2 ATT
Q404 2SC4081 BUFF
Q402 XN4601 BUFF
FL401 DL
FL303
CN307 4P
Y OUT
GND
C OUT
FADER
CHASSIS GND
CPA301
A1 NC
A2 PG CONT
A3 NC
A4 NC
A5 VAP OUT
A6 TP
A7 WB-G
A8 CAM Y
A9 YH
A10 CAM C
A11 YH OUT1
B1 NC
B2 NC
B3 Y LPF OUT
B4 VSUB
B5 VAP SLICE
B6 NC
B7 YH GAIN
B8 Y2 GAIN
B9 NC
B10 GND
B11 IRIS OUT
IC505 AE (I-12)
Q515 XN4601 (H-3) INTEGRATOR
Q514 2SC4081 (I-3) CURRENT SOURCE
IC505 LM3240
IC507 DISCHARGE (G-3)
IC507 TC4566F
IC504 (G-12) EVR/DA CONVERTER
IC504 M62352GP
Q504 SW
IC509 (I-14) RGB SELECT, DISCHARGE
IC509 XRU4066BF
Q508 HIGH LUMI DET, BLANKING
Q507,509 BLK
IC510 LM3240R
IC510 (J-14)
①②③ AW COMPARATOR
⑤⑥⑦ Q510 CURRENT SOURCE
⑧⑨⑩ ⑫⑬⑭ BUFFER TRIANGLE WAVE FORMER
Q513 XN4601 (D-14) BUFF
Q302 2SA1576 (H-14) BUFF
A1 CAM UNREG
A2 CAM UNREG GND
A3 REF1
A4 REF2
A5 REF3.5
A6 CAM 4.9V
A7 HALL OS
A8 HALL OUT
A9 IRIS REF
A10 IRIS CONT
A11 SENS DRIVE
A12 ZOOM SPEED
A13 ZOOM T
A14 ZOOM W
A15 FOCUS 1
A16 FOCUS 2
A17 FOCUS SPEED
A18 Z SENS
A19 F SENS 1
A20 F SENS 2
A22 CAM GND
A21 HALL GAIN
no mark : CAMERA REC mode


15
16
17
18
19
20
21
22
23
24
25
26
TO FU-100 BOARD W991
(See page 141.)
CAM UNREG
CAM GND
CAM DD ON
CAM UNREG
UNREG GND
CAM 4.9V
CAM GND
CAM DC/DC CONV
15V
-9V
5V
GND
VC-94 BOARD
IC401
ENCODER
(I-10)
IC401 CXA1392R (VQFP)
Q403 1/2 ATT
Q404 BUFF
Q402 BUFF
CN307 4P
Y OUT
GND
C OUT
FADER
TO VA-67 BOARD W701
(See page 118.)
CHASSIS GND
CPA301
NC
PG CONT
VAP OUT
TP
WB-G
CAM Y
YH
CAM C
YH OUT1
Y LPF OUT
VSUB
VAP SLICE
YH GAIN
Y2 GAIN
IRIS OUT
CHECK POINT ARRAY
CD-58 BOARD
IC101
CCD IMAGER
(E-13)
IC101 ICX-026CK
Q101 BUFF
Q132 WINDOW
Q133 WINDOW
Q121 AGC DET
DT-77 BOARD
HIC121 (D-2)
NC DT-77 BOARD is replaced as a block.
Q122 PG CONT
Q126 V SUB CONT
Q123,125 V SUB REG
PRIME OSC
CN101 4P
CHASSIS GND
CAM UNREG
CAM UNREG GND
REF1
REF2
REF3.5
CAM 4.9V
HALL OS
HALL OUT
IRIS REF
IRIS CONT
SENS DRIVE
ZOOM SPEED
ZOOM T
ZOOM W
FOCUS1
FOCUS2
FOCUS SPEED
Z SENS
F SENS 1
F SENS 2
CAM GND
HALL GAIN
IC656 LM324DR
Q657 HALL OS BUFF
IC656 ①②③,Q655 BIAS CURRENT CONTRO
⑤⑥⑦ HALL OUT AMP
⑧⑨⑩ BUFF
⑫⑬⑭ REF 2
Q651,659 OVER CURR DET
Q653,654 FOCUS SPEED CONT
IC653 LM358OR
IC653 FOCUS SPEED/ FOCUS FG AMP
no mark : CAMERA REC mode

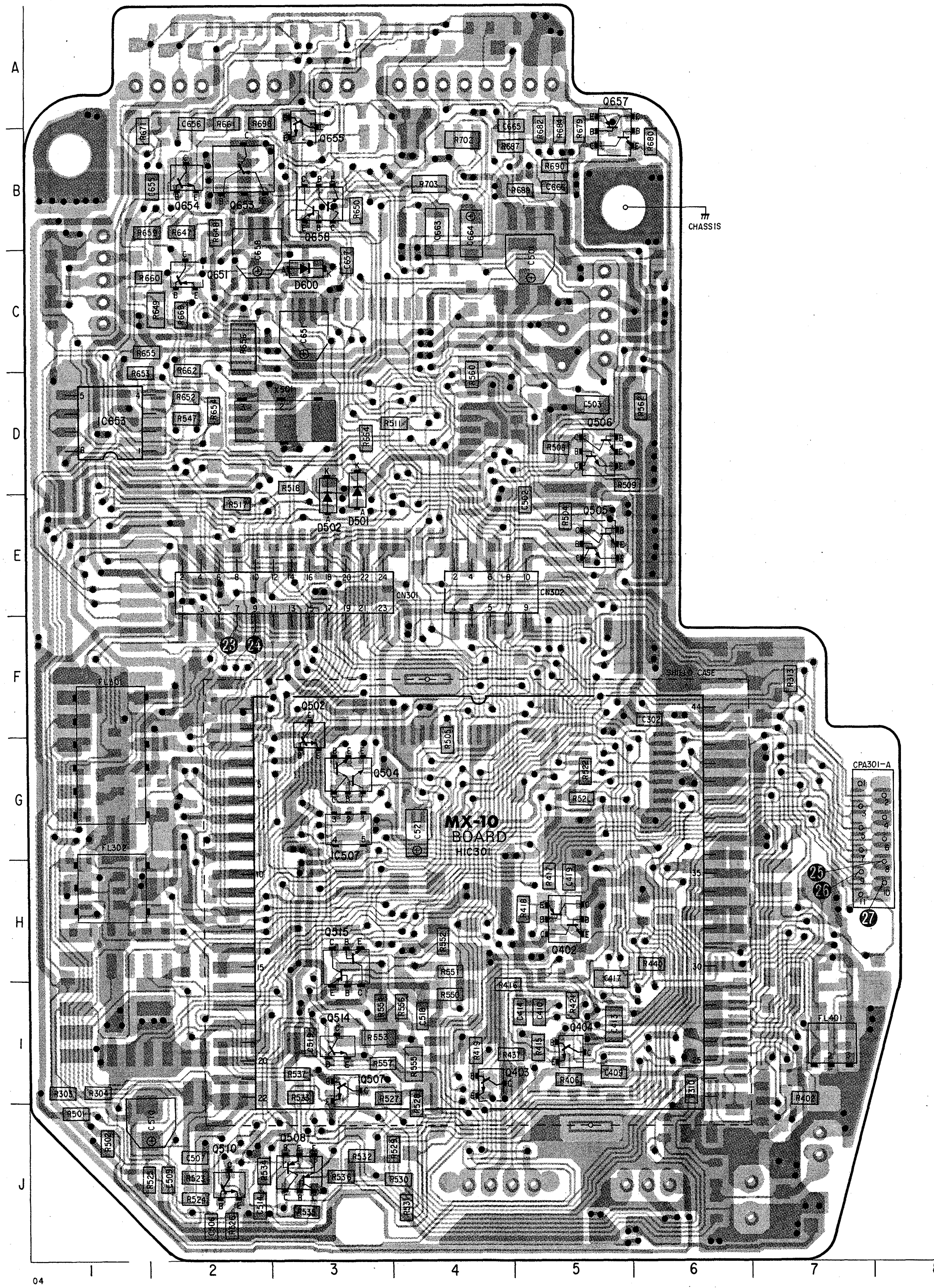

24
25
26
27
28
29
30
31
32
DT-77 BOARD
DT-77 BOARD is replaced as a block.
(D-2)
HIC121
Q121 AGC DET
Q131 IRIS DET
Q135 BUFF
Q136 SWITCH
Q102 BUFF
Q129 WINDOW PULSE GENERATOR
Q122 PG CONT
Q126 V SUB CONT
Q123,125 V SUB REG
PRIME OSC
IC121
(C-16) IC121 CXD1159Q SYNC GENERATOR
CHASSIS GND
TO VC-94 BOARD CN301 (See page 96.)
TO VC-94 BOARD CN302 (See page 96.)
V102 34P
1 CL
2 GND
3 HD
4 VD
5 Y
6 CS OUT
7 S2
8 VG
9 S1
10 GND
11 XOL2
12 CLP3
13 XOL1
14 CLP4
15 ID
16 DATA
17 CK
18 SHUT LEV
19 CLP2
20 VSUB CONT
21 AGC REF
22 MAX GAIN
23 LALT
24 STB
25 BFG
26 AGC CONT F
27 BF
28 AGC CONT R
29 BLK
30 IRIS CONT
31 SYNC
32 PG CONT
33 VSUB
34 CCD DET SW
IC656 LM324DR
IC656 ①②③,Q655 BIAS CURRENT CONTROL
⑤⑥⑦ HALL OUT AMP
⑧⑨⑩ BUFF
⑫⑬⑭ REF 2
Q658 BUFF
IC651 RC3414M-TI
IC651 (B-11) IRIS DRIVE, HALL AMP
Q651,659 OVER CURR DET
Q653,654 FOCUS SPEED CONT
IC652 FOCUS M DRIVE
IC652 μPC1737
IC653 LM358OR
FOCUS SPEED/ FOCUS FG AMP
Q656 LED POWER
LENS BLOCK
IRIS MOTOR
HALL DEVICE
CN651 8P L SMK
1 DRIVE (+)
2 DRIVE (-)
3 CONT (+)
4 CONT (-)
5 BIAS (+)
6 HALL (-)
7 HALL (+)
8 BIAS (-)
CN653 2P L SMK
1 FOCUS N
2 FOCUS ∞
M906 FOCUS MOTOR
CN654 4P L SMK
1 Z SENS 1
2 Z SENS 2
3 Z SENS 3
4 GND
ZOOM SENSE
CN652 2P L SMK
1 ZOOM T
2 ZOOM W
M905 ZOOM MOTOR
CN655 5P L SMK
1 F SENS 1
2 F SENS 2
3 LED POWER
4 GND
5 CAM 4.9V
FOCUS SENSE
TO LENS
⑥
⑦
⑧
⑩
⑪

no mark : CAMERA REC mode

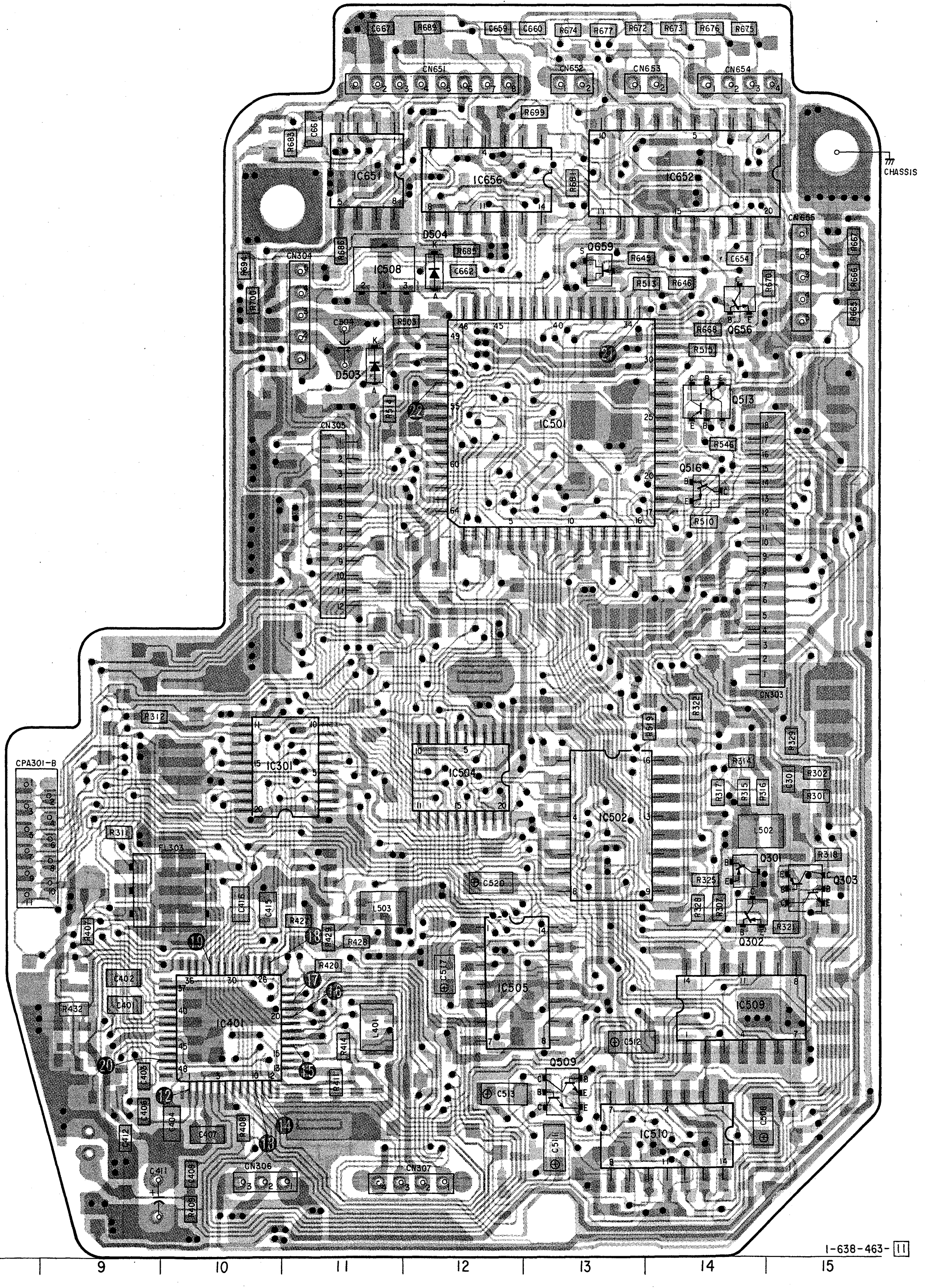
CD-58 (CCD IMAGER), VC-94 (CAMERA PROCESS, ZOOM/FOCUS) PRINTED WIRING BOARDS

—Ref. No. CD-58 and, VC-94 BOARDS : 1000 series—

VC-94 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
J
04
1
2
3
4
5
6
7
8
CHASSIS
MX-10 BOARD
HIC301
SHIELD CASE
CPA301-A
CN301
CN302
IC653
Q657
Q654
Q655
Q658
Q651
D600
D502
D501
Q506
Q505
Q502
Q504
IC507
Q515
Q514
Q507
Q510
Q508
Q402
Q404
Q403
FL401
FL301
FL302

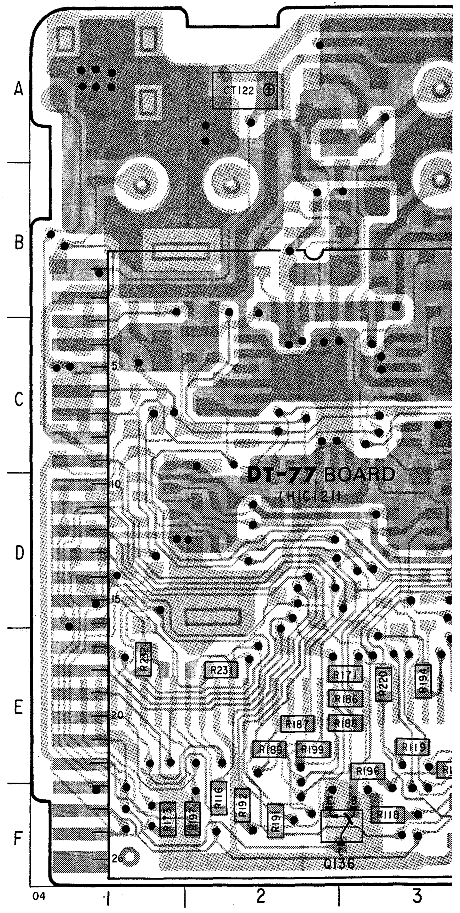
VC-94 BOARD (CONDUCTOR SIDE)


9
10
11
12
13
14
15
CHASSIS
CPA301-B
CN651
CN652
CN653
CN654
CN655
CN304
CN305
CN303
CN306
CN307
IC651
IC656
IC652
IC508
IC501
IC301
IC504
IC502
IC401
IC505
IC509
IC510
D504
D505
Q659
Q656
Q513
Q516
Q301
Q302
Q303
Q509
FL303
1-638-463-11

< DIODE >		
D101	8-719-404-46	MA110
D102	8-719-404-52	MA143
D122	8-719-404-32	MA141WA
D123	8-719-404-46	MA110
D124	8-719-404-32	MA141WA
D126	8-719-404-46	MA110
D128	8-719-404-46	MA110
D501	8-719-404-46	MA110
D502	8-719-404-46	MA110
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110
D600	8-719-420-90	MA8051-M

<
IC
IC
IC
IC
IC
IC
IC
IC
IC
IC
IC
IC
IC
IC
IC
IC

CD-58 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
04
1
2
3
DT-77 BOARD
(HIC121)
CT122
Q136

Be sure to always read "Precautions for replace
block" in page 95 when replacing the CD-58 bo
board, complete and CCD imager block (IC101 on
IC001 on the DT-77 board).

< DIODE >

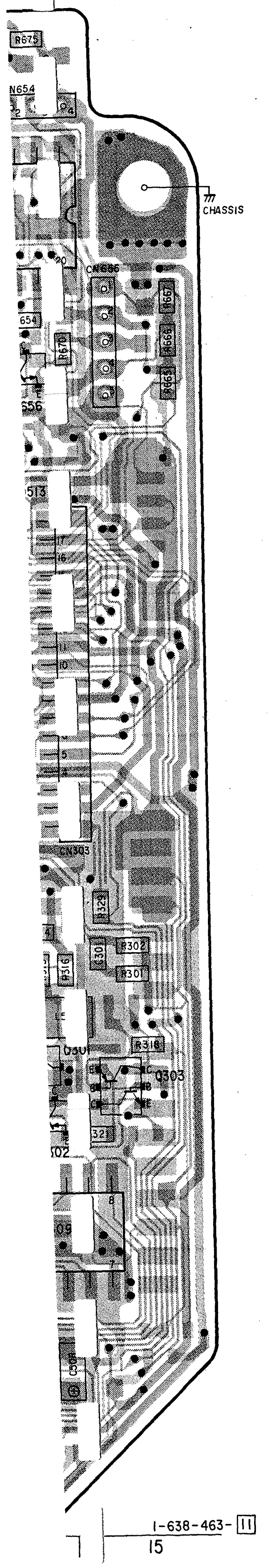
D101	8-719-404-46	MA110
D102	8-719-404-52	MA143
D122	8-719-404-32	MA141WA
D123	8-719-404-46	MA110
D124	8-719-404-32	MA141WA
D126	8-719-404-46	MA110
D128	8-719-404-46	MA110
D501	8-719-404-46	MA110
D502	8-719-404-46	MA110
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110
D600	8-719-420-90	MA8051-M

< IC >

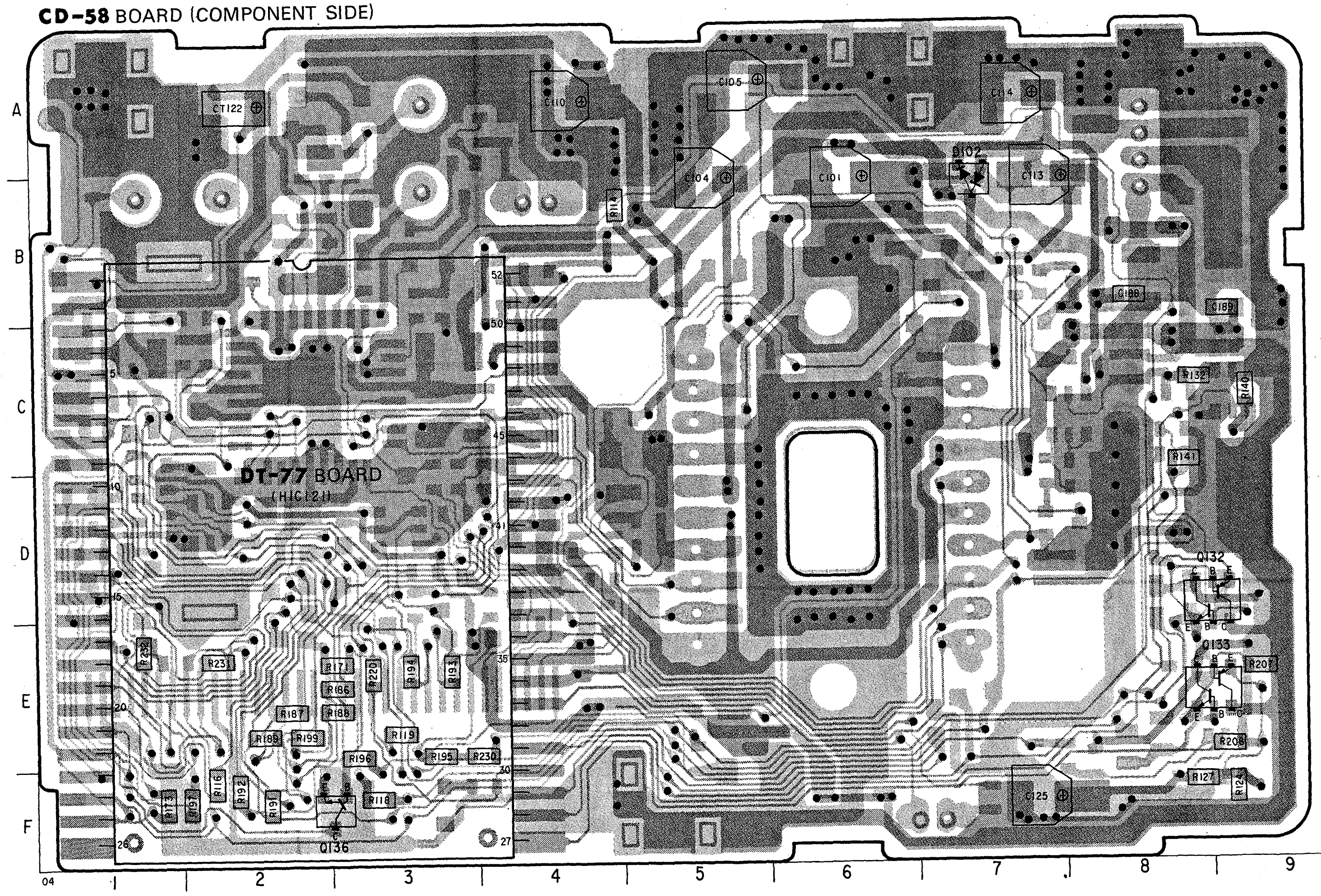
IC121	8-752-326-08	CXD1159Q
IC301	8-759-946-00	MB88341PFV
IC401	8-752-038-XX	CXA1392R
IC501	8-759-038-86	MC68HC11E9FU-SC400225
IC502	8-759-008-95	MC14028BF
IC504	8-759-635-27	M62352GP
IC505	8-759-998-96	LM324D
IC507	8-759-234-77	TC4S66F
IC508	8-759-937-56	S-8054ALB-LM-S
IC509	8-759-509-05	XRU4066BF
IC510	8-759-998-96	LM324D
IC651	8-759-981-82	RC3414M
IC652	8-759-037-20	MPC1737M
IC653	8-759-998-98	LM358D
IC656	8-759-998-96	LM324D

< TRANSISTOR >

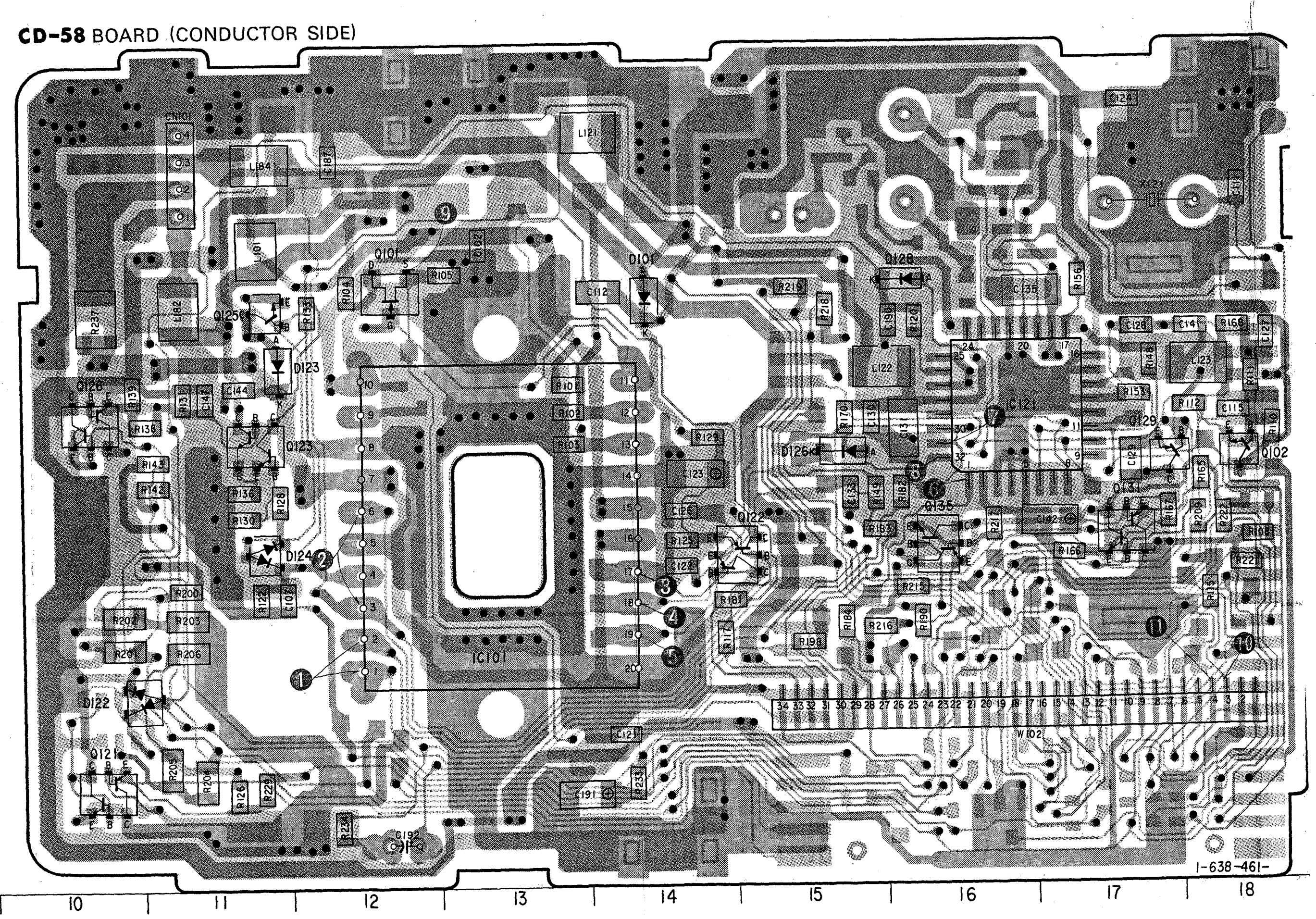
Q101	8-765-420-02	2SK300-3
Q102	8-729-905-35	2SC4081-R
Q121	8-729-402-84	XN4601
Q122	8-729-402-78	XN6401
Q123	8-729-402-19	XN6501
Q125	8-729-905-35	2SC4081-R
Q126	8-729-402-84	XN4601
Q129	8-729-905-23	2SA1576-R
Q131	8-729-402-84	XN4601
Q132	8-729-402-84	XN4601
Q133	8-729-402-84	XN4601
Q135	8-729-402-84	XN4601
Q136	8-729-402-45	UN5212
Q301	8-729-905-23	2SA1576-R
Q302	8-729-905-23	2SA1576-R
Q303	8-729-402-84	XN4601
Q402	8-729-402-84	XN4601
Q403	8-729-905-23	2SA1576-R
Q404	8-729-905-35	2SC4081-R
Q502	8-729-420-50	UN5215
Q504	8-729-403-10	XN6215
Q505	8-729-403-10	XN6215
Q506	8-729-420-07	XN6213
Q507	8-729-420-50	UN5215
Q508	8-729-402-78	XN6401
Q509	8-729-403-10	XN6215
Q510	8-729-905-35	2SC4081-R
Q513	8-729-402-84	XN4601
Q514	8-729-905-35	2SC4081-R
Q515	8-729-402-84	XN4601
Q516	8-729-905-35	2SC4081-R
Q651	8-729-905-23	2SA1576-R
Q653	8-729-106-60	2SB1115A
Q654	8-729-905-35	2SC4081-R
Q655	8-729-905-35	2SC4081-R
Q656	8-729-905-35	2SC4081-R
Q657	8-729-402-84	XN4601
Q658	8-729-402-84	XN4601
Q659	8-729-821-88	2SK1332-3


CHASSIS
R675
N654
CN303
R302
R301
Q303
1-638-463- 11
15

CD-58 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
DT-77 BOARD
(HIC121)
Q102
Q132
Q133
Q136
C101
C104
C105
C110
C113
C114
C125
CT122
1
2
3
4
5
6
7
8
9

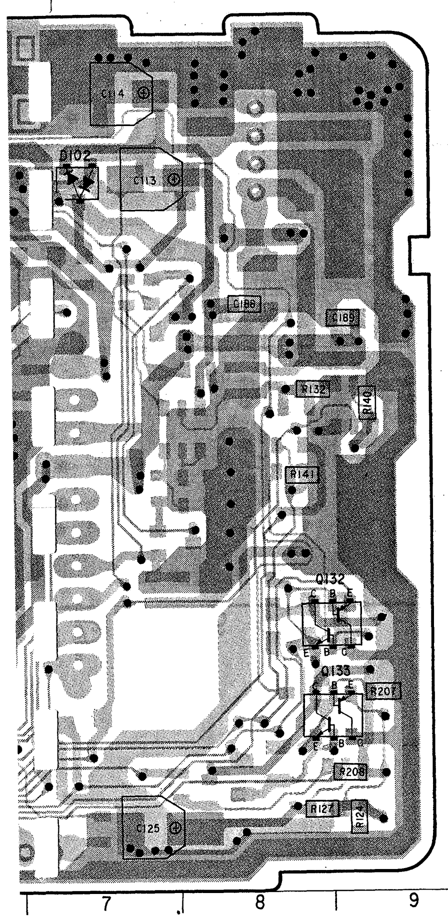
CD-58 BOARD (CONDUCTOR SIDE)


IC101
IC121
Q101
Q102
Q121
Q122
Q123
Q125
Q126
Q129
Q131
Q135
D101
D122
D123
D124
D126
D128
CN101
W102
1-638-461-
10
11
12
13
14
15
16
17
18

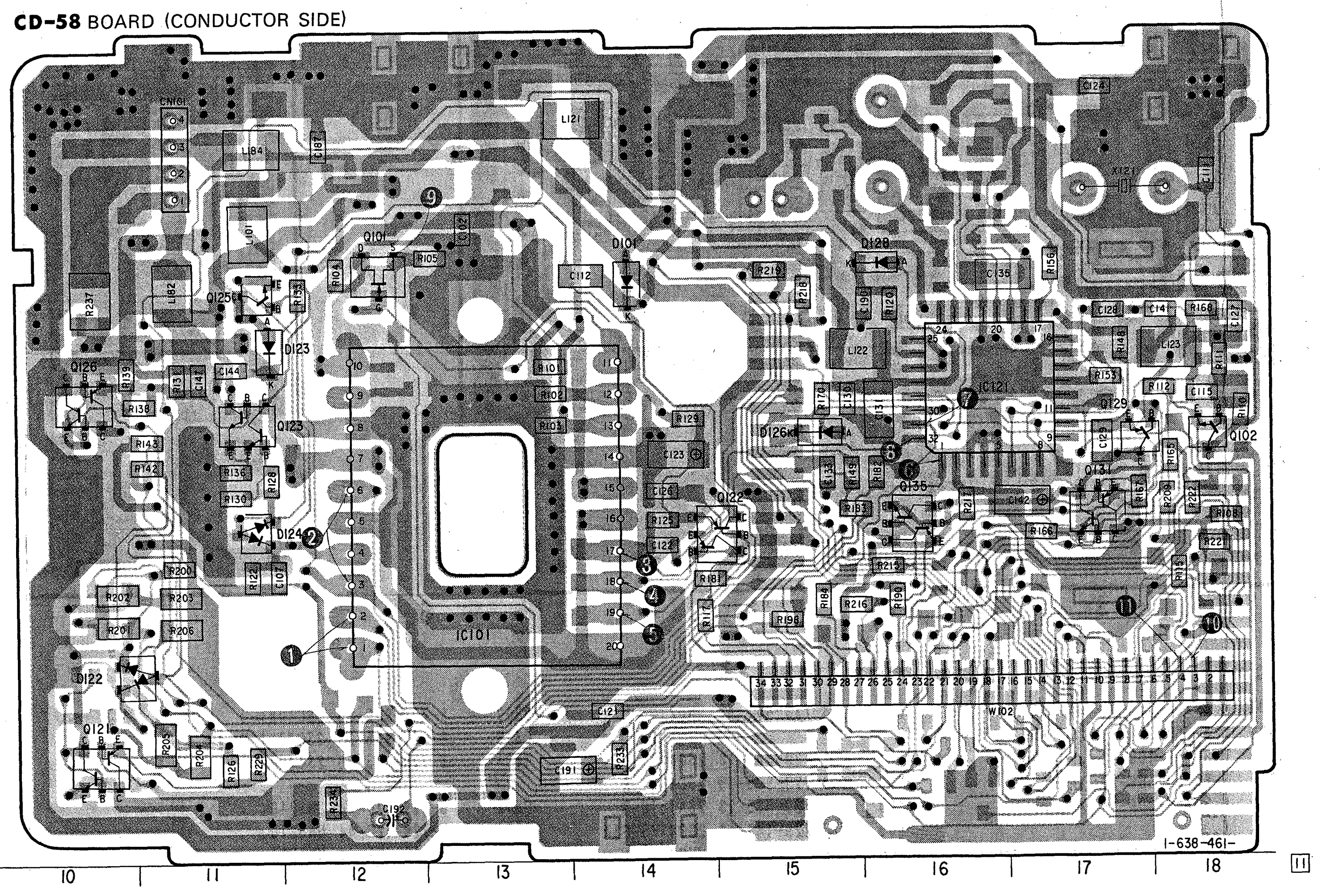
Be sure to always read "Precautions for replacement of CCD imager block" in page 95 when replacing the CD-58 board, complete, DT-77 board, complete and CCD imager block (IC101 on the CD-58 board and IC001 on the DT-77 board).

< TRANSISTOR >

Q101	8-765-420-02	2SK300-3	Q504	8-729-403-10	XN6215
Q1	8-729-905-35	2SC4081-R	Q505	8-729-403-10	XN6215
Q1	8-729-402-84	XN4601	Q506	8-729-420-07	XN6213
Q122	8-729-402-78	XN6401	Q507	8-729-420-50	UN5215
Q123	8-729-402-19	XN6501	Q508	8-729-402-78	XN6401
Q1	8-729-905-35	2SC4081-R	Q509	8-729-403-10	XN6215
Q126	8-729-402-84	XN4601	Q510	8-729-905-35	2SC4081-R
Q129	8-729-905-23	2SA1576-R	Q513	8-729-402-84	XN4601
Q1	8-729-402-84	XN4601	Q514	8-729-905-35	2SC4081-R
Q1	8-729-402-84	XN4601	Q515	8-729-402-84	XN4601
Q133	8-729-402-84	XN4601	Q516	8-729-905-35	2SC4081-R
Q1	8-729-402-84	XN4601	Q651	8-729-905-23	2SA1576-R
Q1	8-729-402-45	UN5212	Q653	8-729-106-60	2SB1115A
Q3	8-729-905-23	2SA1576-R	Q654	8-729-905-35	2SC4081-R
Q302	8-729-905-23	2SA1576-R	Q655	8-729-905-35	2SC4081-R
Q3	8-729-402-84	XN4601	Q656	8-729-905-35	2SC4081-R
Q4	8-729-402-84	XN4601	Q657	8-729-402-84	XN4601
Q403	8-729-905-23	2SA1576-R	Q658	8-729-402-84	XN4601
Q404	8-729-905-35	2SC4081-R	Q659	8-729-821-88	2SK1332-3
Q5	8-729-420-50	UN5215			


C114
D102
C113
C188
C185
R132
R140
R141
Q132
Q133
R207
R208
R127
C125
7
8
9

CD-58 BOARD (CONDUCTOR SIDE)


CN101
L184
C187
L121
C124
X12
L101
Q101
R105
D101
C112
D128
C138
R156
R237
L182
Q125
D123
R104
R216
R218
C128
C141
R166
Q126
R139
R138
R143
R142
C144
Q123
R101
R102
R103
IC101
IC121
L122
L123
R153
R112
C115
Q129
Q102
R136
R130
R128
D124
C123
C126
Q122
R125
R181
D126
Q135
R162
R166
Q131
R202
R201
R200
R203
R206
D122
Q121
R205
R204
R226
C121
C191
R233
R234
C192
W102
1-638-461-
11
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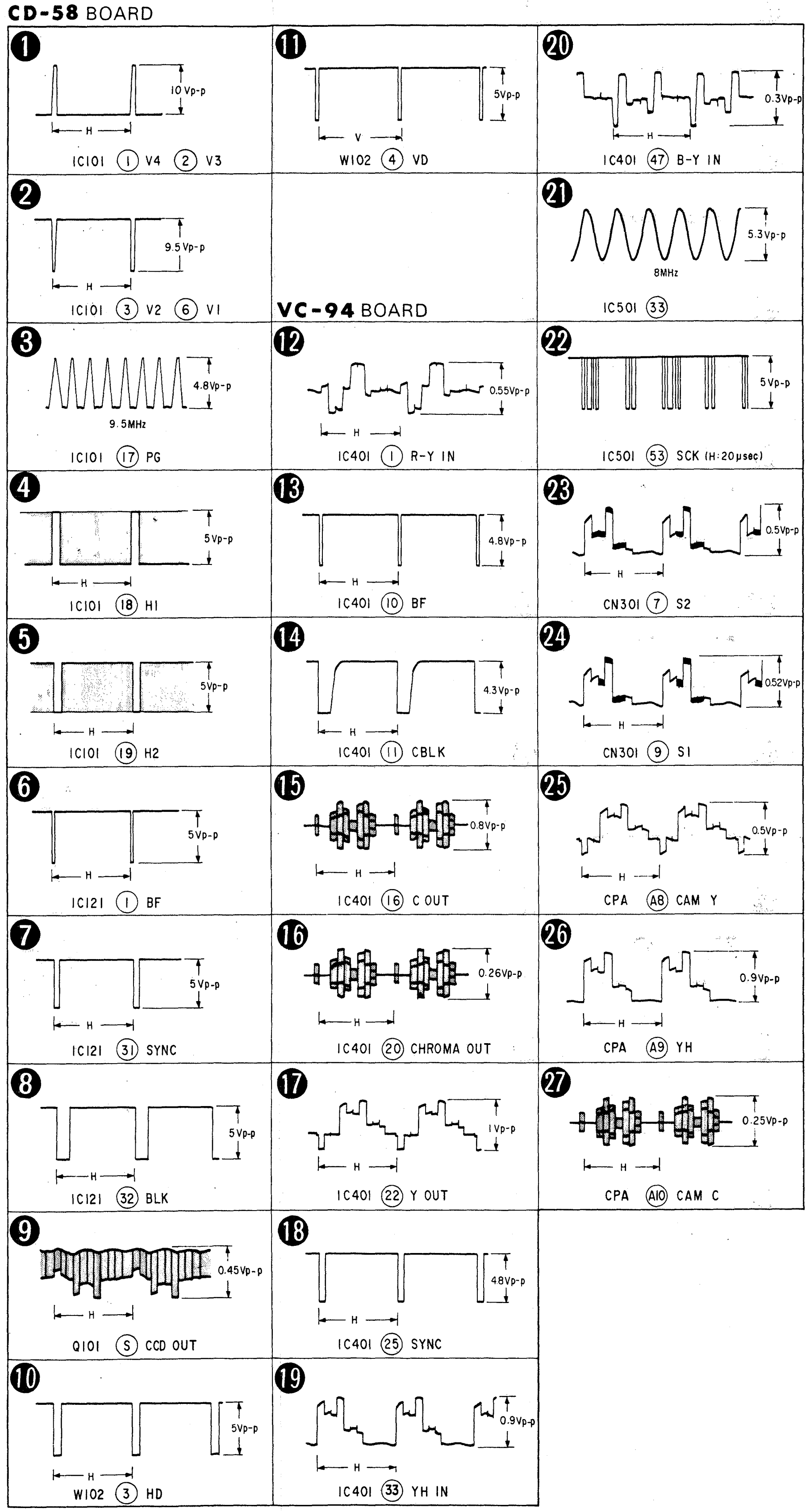
18

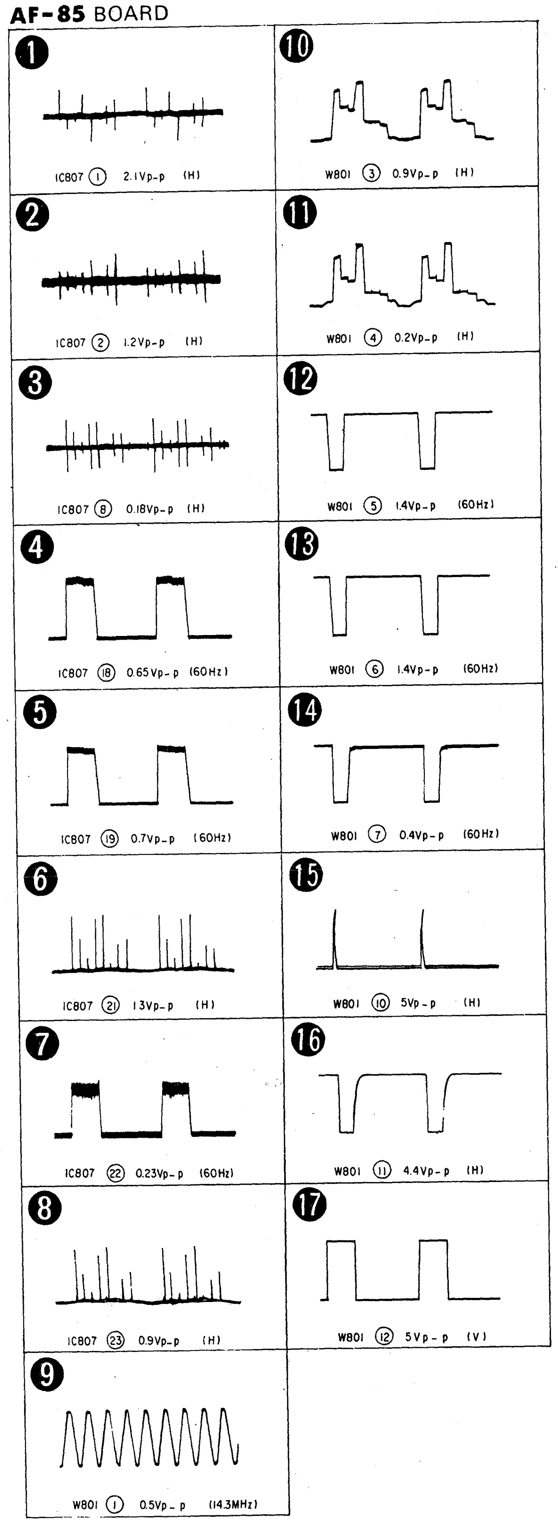
CD-58 BOARD

VC-94 BOARD

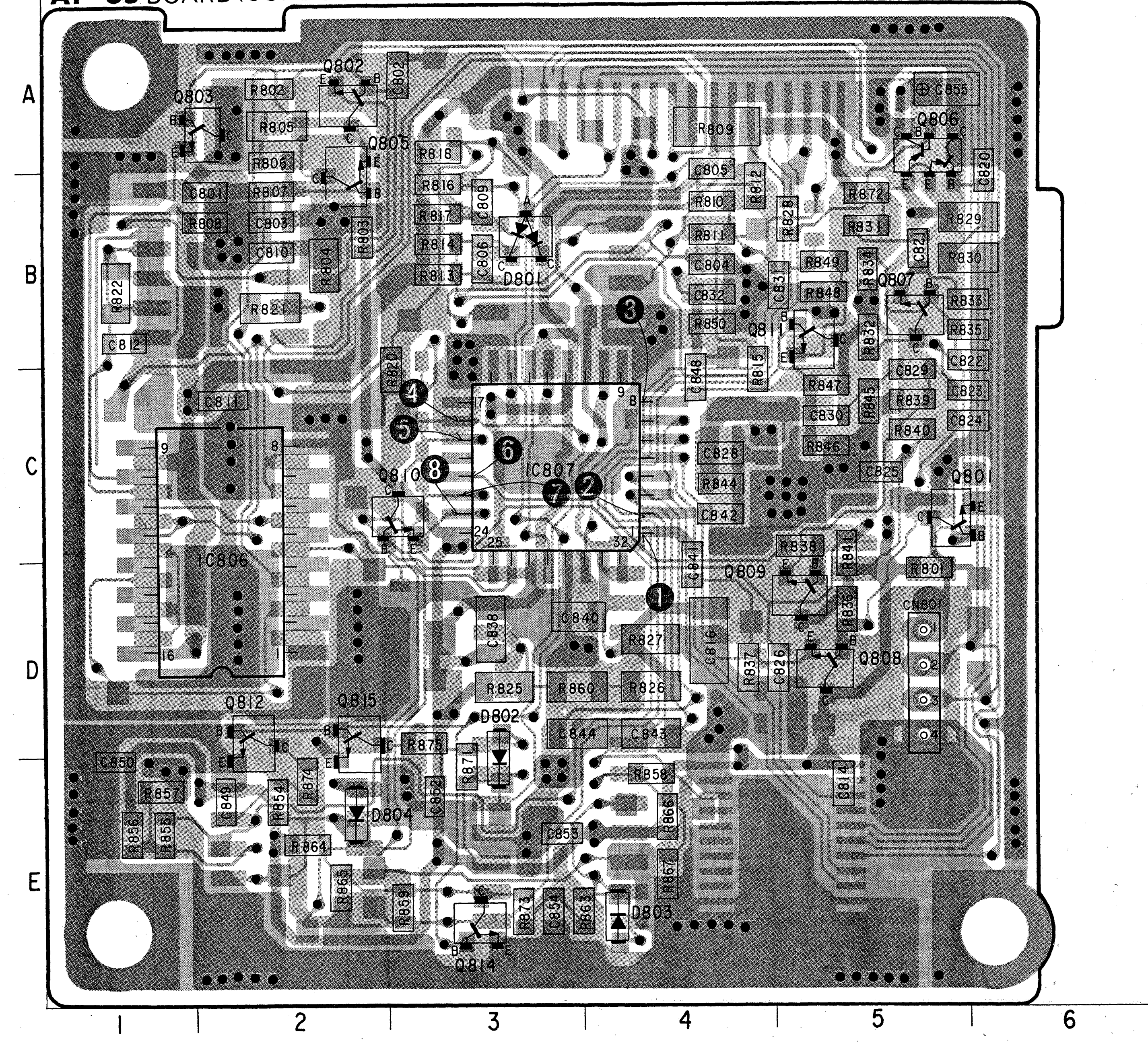

❶
10Vp-p
H
IC101 ① V4 ② V3
❷
9.5Vp-p
H
IC101 ③ V2 ⑥ V1
❸
4.8Vp-p
9.5MHz
IC101 ⑰ PG
❹
5Vp-p
H
IC101 ⑱ H1
❺
5Vp-p
H
IC101 ⑲ H2
❻
5Vp-p
H
IC121 ① BF
❼
5Vp-p
H
IC121 ㉛ SYNC
❽
5Vp-p
H
IC121 ㉜ BLK
❾
0.45Vp-p
H
Q101 Ⓢ CCD OUT
❿
5Vp-p
H
W102 ③ HD
⓫
5Vp-p
V
W102 ④ VD
⓬
0.55Vp-p
H
IC401 ① R-Y IN
⓭
4.8Vp-p
H
IC401 ⑩ BF
⓮
4.3Vp-p
H
IC401 ⑪ CBLK
⓯
0.8Vp-p
H
IC401 ⑯ C OUT
⓰
0.26Vp-p
H
IC401 ⑳ CHROMA OUT
⓱
1Vp-p
H
IC401 ㉒ Y OUT
⓲
4.8Vp-p
H
IC401 ㉕ SYNC
⓳
0.9Vp-p
H
IC401 ㉝ YH IN
⓴
0.3Vp-p
H
IC401 ㊼ B-Y IN
(21)
5.3Vp-p
8MHz
IC501 ㉝
(22)
5Vp-p
IC501 (53) SCK (H:20μsec)
(23)
0.5Vp-p
H
CN301 ⑦ S2
(24)
0.52Vp-p
H
CN301 ⑨ S1
(25)
0.5Vp-p
H
CPA (A8) CAM Y
(26)
0.9Vp-p
H
CPA (A9) YH
(27)
0.25Vp-p
H
CPA (A10) CAM C

AF-85 (AUTO FOCUS) PRINTED WIRING BOARD
—Ref. No. AF-85 BOARD: 1000 series—

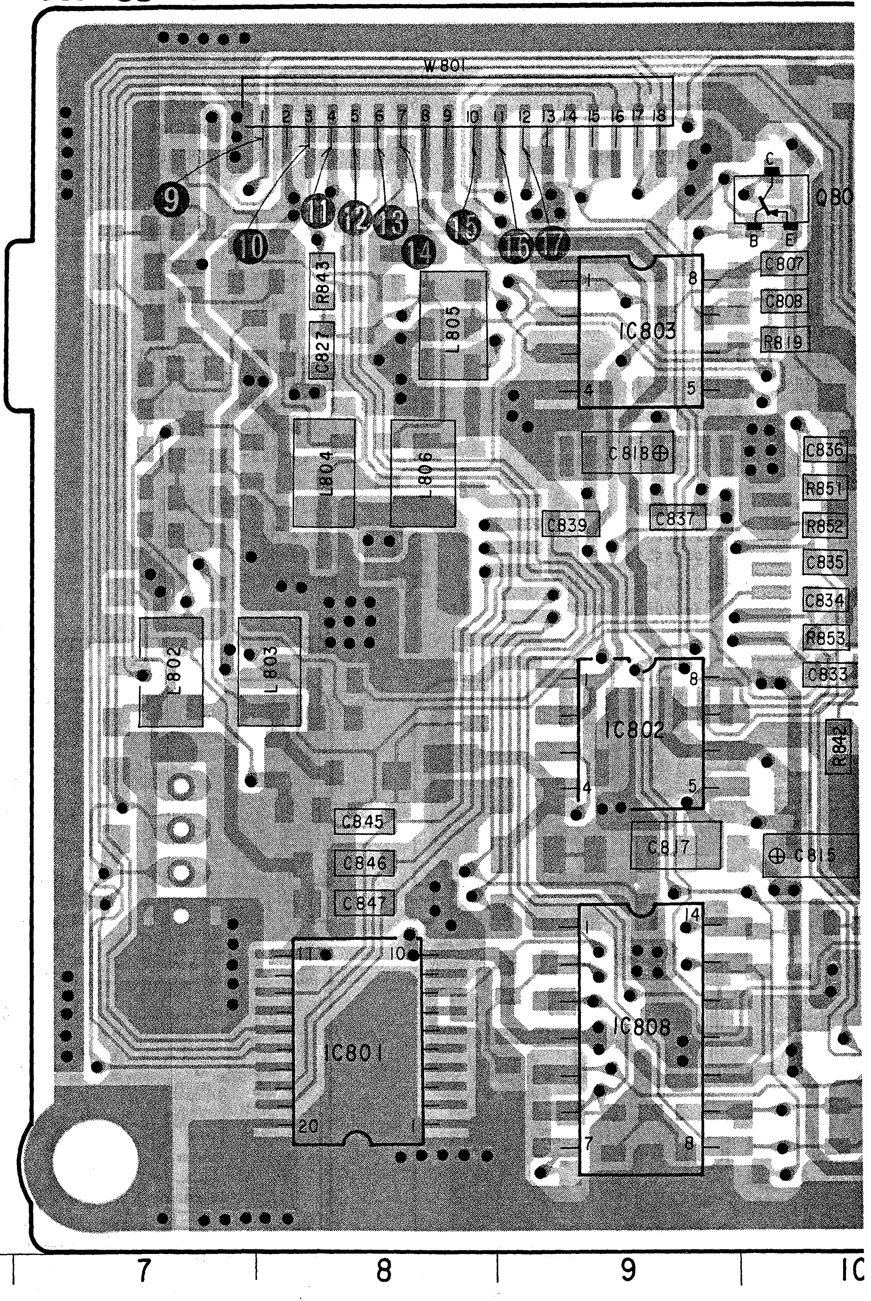
AF-85 BOARD



AF-85 BOARD (CONDUCTOR SIDE)


A
B
C
D
E
1
2
3
4
5
6
Q802
Q803
Q805
R802
R805
R806
R807
R808
C801
C803
C810
C802
R804
R803
R821
R822
C812
C811
R818
R816
R817
R814
R813
C809
C806
D801
R809
C805
R810
R811
C804
C832
R850
R812
R828
C831
R815
C848
Q811
R849
R848
R834
R832
R847
C830
R846
R845
R872
R831
C821
Q806
C855
C820
R829
R830
Q807
R833
R835
C829
C822
R839
C823
R840
C824
C825
Q801
R801
R820
Q810
IC807
IC806
C828
R844
C842
C841
R836
Q809
R841
R835
CN801
Q808
C837
C826
C816
R837
C838
C840
R827
R825
R860
R826
D802
C844
C843
R858
R866
C814
R867
C853
Q812
Q815
C850
R857
C849
R854
R874
R875
R856
R855
R864
D804
C852
R871
R865
R859
Q814
R873
C854
R863
D803

A F-85 BOARD (COMPONENT SIDE)


W801
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
❾
❿
⓫
⓬
⓭
⓮
⓯
⓰
⓱
C827
R843
L805
IC803
C807
C808
R819
L804
L806
C818
C839
C837
C836
R851
R852
C835
C834
R853
C833
L802
L803
IC802
R842
C845
C846
C847
C817
C815
IC801
IC808
7
8
9
10

04

< DIODE >

D801	8-719-404-32	MA141WA
D802	8-719-404-46	MA110
D803	8-719-404-46	MA110
D804	8-719-404-46	MA110

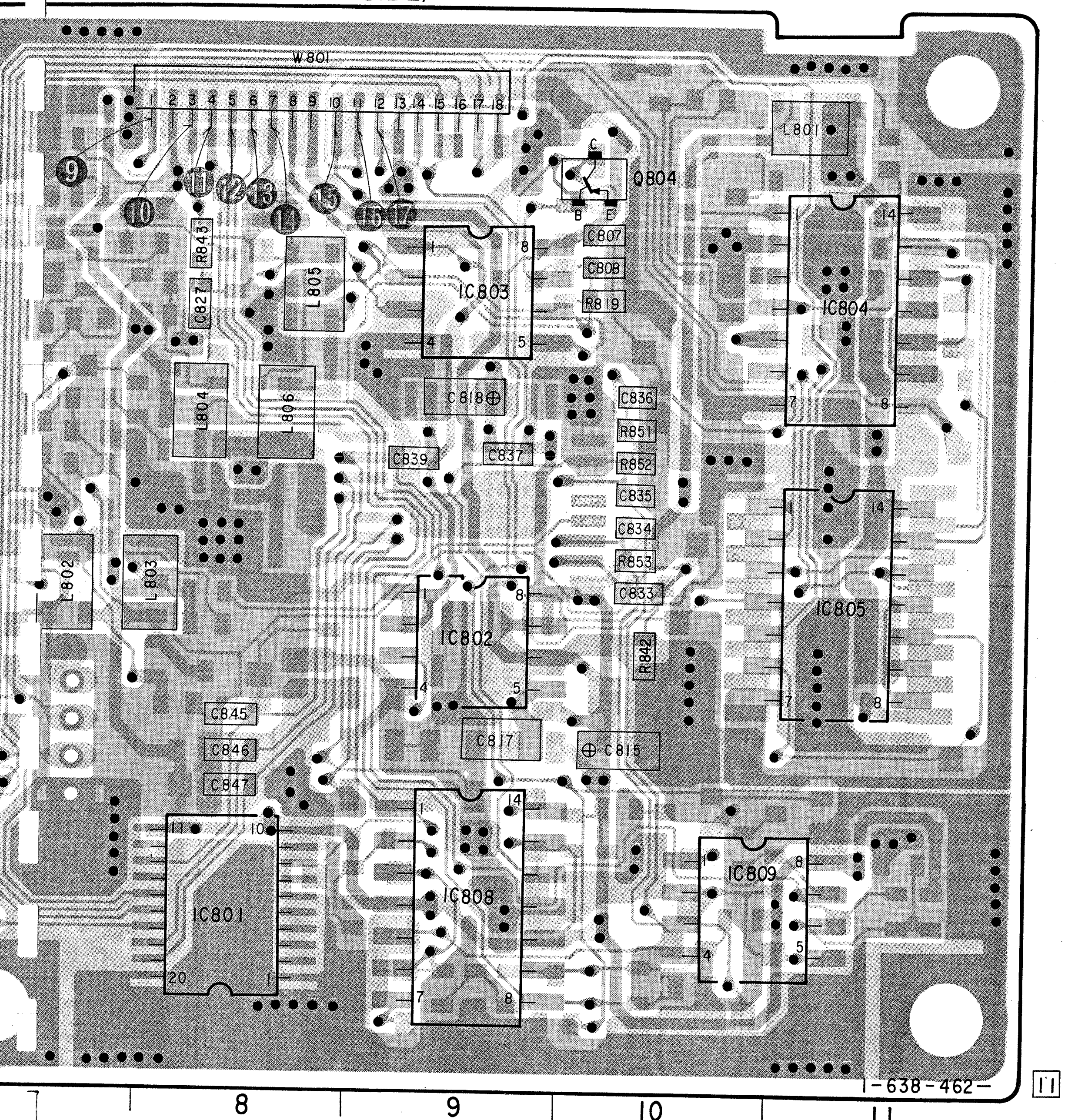
< IC >

IC801	8-759-946-00	MB88341PFV
IC802	8-759-998-98	LM358DR
IC803	8-759-100-93	uPC393G2
IC804	8-759-509-29	XRU4011BF
IC805	8-759-509-29	XRU4011BF
IC806	8-759-926-98	SN74HC4040NS
IC807	8-752-055-56	CXA1516Q
IC808	8-759-998-96	LM324DR
IC809	8-759-998-98	LM358DR

< TRANSISTOR >

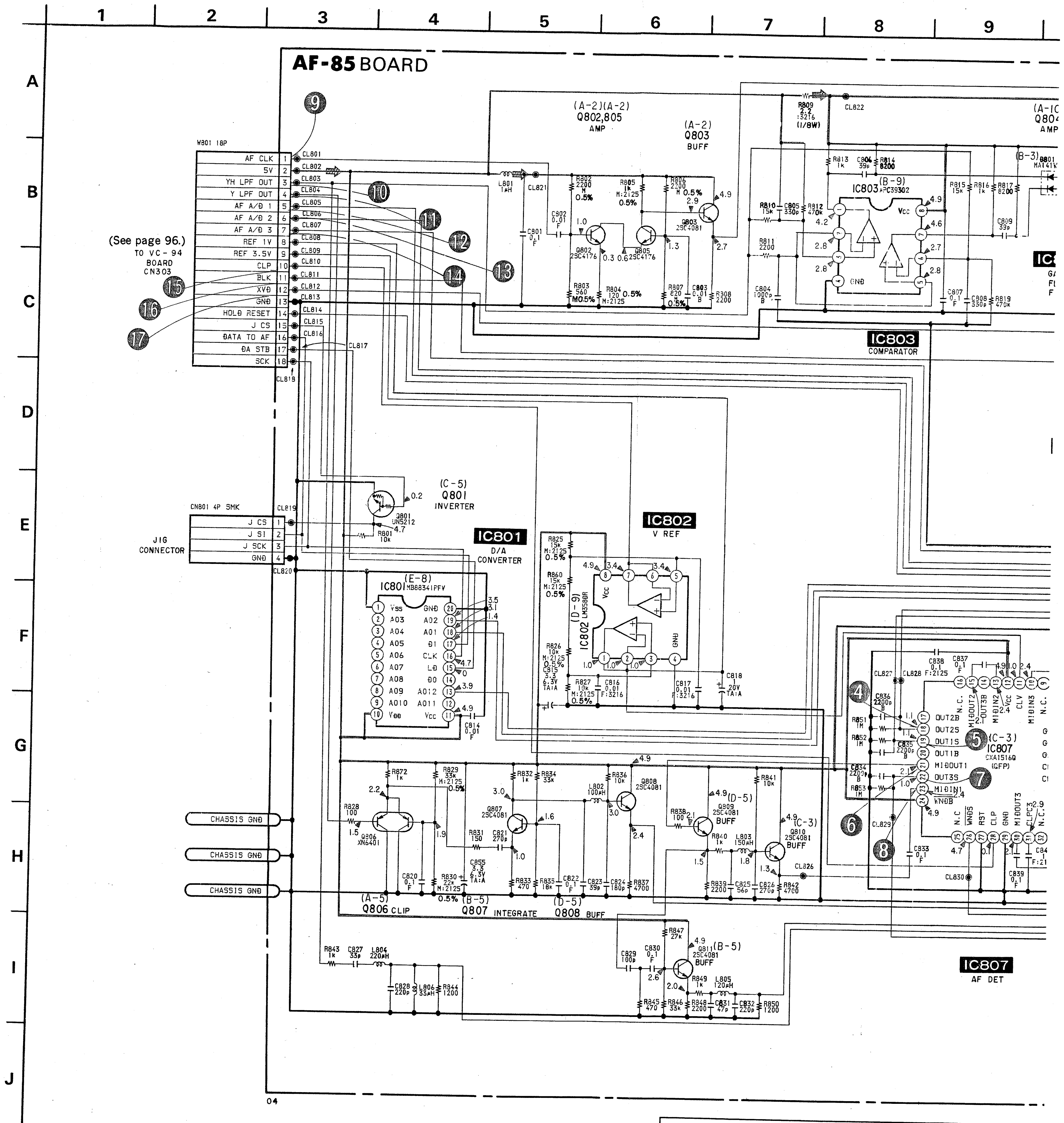
Q801	8-729-402-45	UN5212
Q802	8-729-143-13	2SC4176-B34
Q803	8-729-905-35	2SC4081-R
Q804	8-729-905-23	2SA1576-R
Q805	8-729-143-13	2SC4176-B34
Q806	8-729-402-78	XN6401
Q807	8-729-905-35	2SC4081-R
Q808	8-729-905-35	2SC4081-R
Q809	8-729-905-35	2SC4081-R
Q810	8-729-905-35	2SC4081-R
Q811	8-729-905-35	2SC4081-R
Q812	8-729-420-44	UN5210
Q814	8-729-420-44	UN5210
Q815	8-729-420-44	UN5210

F- 5 BOARD (COMPONENT SIDE)


W801
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
Q804
C
B
E
L801
R843
C827
L805
IC803
C807
C808
R819
IC804
L804
L806
C818
C836
R851
R852
C835
C834
R853
C833
C837
C839
IC805
L802
L803
IC802
R842
C845
C846
C847
C817
C815
IC801
IC808
IC809
1-638-462-
11
8
9
10
11

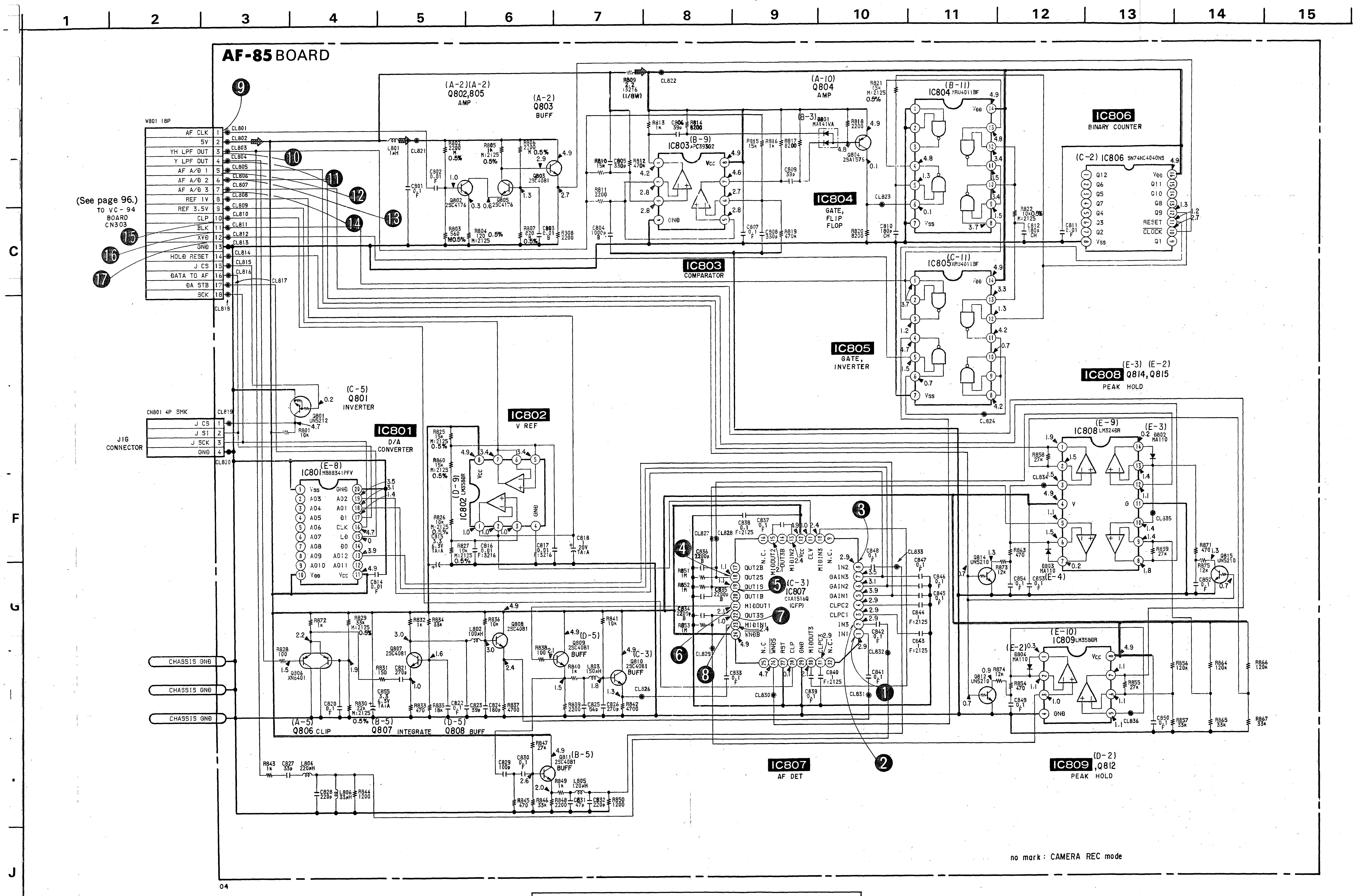
AF-85 (AUTO FOCUS) SCHEMATIC DIAGRAM

—Ref. No. AF-85 BOARD : 1000 series—


1 2 3 4 5 6 7 8 9
A B C D E F G H I J
AF-85 BOARD
W801 18P
AF CLK
5V
YH LPF OUT
Y LPF OUT
AF A/D 1
AF A/D 2
AF A/D 3
REF 1V
REF 3.5V
CLP
BLK
XVD
GND
HOLD RESET
J CS
DATA TO AF
DA STB
SCK
(See page 96.)
TO VC-94
BOARD
CN303
(A-2)(A-2)
Q802,805
AMP
(A-2)
Q803
BUFF
IC803
COMPARATOR
CN801 4P SMK
J CS
J SI
J SCK
GND
JIG
CONNECTOR
(C-5)
Q801
INVERTER
IC801
D/A
CONVERTER
(E-8)
IC801 MB88341PFV
IC802
V REF
(D-9)
IC802 LM358M
(C-3)
IC807
CXA1516Q
(GFP)
IC807
AF DET
CHASSIS GND
CHASSIS GND
CHASSIS GND
(A-5)
Q806 CLIP
(B-5)
Q807 INTEGRATE
(D-5)
Q808 BUFF
(D-5)
Q809
BUFF
(C-3)
Q810
BUFF
(B-5)
Q811
BUFF
04

AF-85 (AUTO FOCUS) SCHEMATIC DIAGRAM

—Ref. No. AF-85 BOARD : 1000 series—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
C
F
G
J
AF-85 BOARD
WB01 18P
AF CLK
5V
YH LPF OUT
Y LPF OUT
AF A/Ø 1
AF A/Ø 2
AF A/Ø 3
REF 1V
REF 3.5V
CLP
BLK
XVØ
GNØ
HOLØ RESET
J CS
ØATA TO AF
ØA STB
SCK
(See page 96.)
TO VC-94 BOARD CN303
CN801 4P SMK
J CS
J SI
J SCK
GNØ
JIG CONNECTOR
CHASSIS GNØ
CHASSIS GNØ
CHASSIS GNØ
(A-2)(A-2) Q802,805 AMP
(A-2) Q803 BUFF
(A-10) Q804 AMP
IC803 COMPARATOR
IC804 GATE, FLIP FLOP
IC805 GATE, INVERTER
IC806 BINARY COUNTER
(C-2) IC806 SN74HC4040NS
(B-11) IC804 XRU4011BF
(C-11) IC805 XRU4011BF
(B-9) IC803 μPC393G2
(C-5) Q801 INVERTER
IC801 D/A CONVERTER
(E-8) IC801 MB88341PFV
IC802 V REF
(D-9) IC802 LM358M
(C-3) IC807 CXA1516Q (GFP)
IC807 AF DET
IC808 PEAK HOLD
(E-3) (E-2) IC808 Q814,Q815
(E-9) IC808 LM3240R
(E-10) IC809 LM358M
(D-2) IC809 ,Q812 PEAK HOLD
(A-5) Q806 CLIP
(B-5) Q807 INTEGRATE
(D-5) Q808 BUFF
(D-5) Q809 2SC4081 BUFF
(C-3) Q810 2SC4081 BUFF
(B-5) Q811 2SC4081 BUFF
no mark : CAMERA REC mode
04

< DIODE >

D901	8-719-949-46	DIODE	1T32
D903	8-719-404-46	DIODE	MA110
D904	8-719-404-46	DIODE	MA110
D905	8-719-404-46	DIODE	MA110
D906	8-719-404-46	DIODE	MA110

< IC >

IC701	8-759-998-30	CF79028PG
IC702	8-759-979-96	MB8464A-15LLPF
IC703	8-752-039-49	CXA1393AN
IC704	8-759-634-47	M51285BGP
IC707	8-759-710-29	NJM2235M
IC708	8-759-710-09	NJM2233AM
IC709	8-759-710-09	NJM2233AM
IC713	8-759-234-20	TC7S08F
IC901	8-759-970-80	MB673198U
IC902	8-759-153-41	uPD6451AGT-611-E1

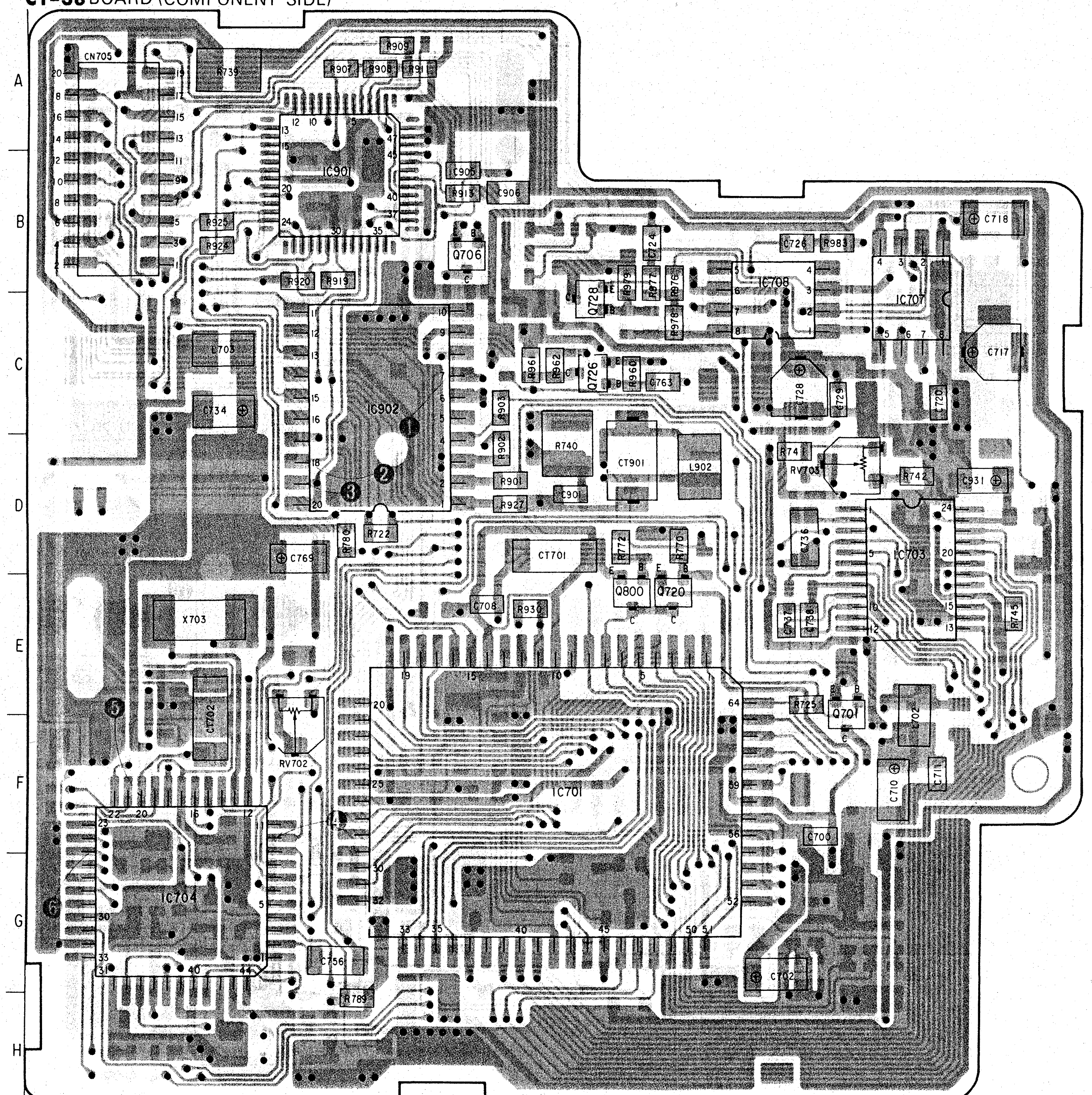
< TRANSISTOR >

Q701	8-729-925-91	DTC115EU
Q702	8-729-907-03	FMG5
Q703	8-729-905-18	DTC144EU
Q704	8-729-402-32	2SD1819A-R
Q705	8-729-905-24	2SA1576-R
Q706	8-729-905-18	DTC144EU
Q707	8-729-402-32	2SD1819A-R
Q708	8-729-905-15	DTC144WU
Q709	8-729-402-32	2SD1819A-R
Q710	8-729-402-32	2SD1819A-R
Q720	8-729-905-18	DTC144EU
Q726	8-729-402-55	2SB1218A-R
Q727	8-729-402-32	2SD1819A-R
Q728	8-729-402-32	2SD1819A-R
Q729	8-729-905-18	DTC144EU
Q730	8-729-905-12	DTA144EU
Q800	8-729-905-18	DTC144EU
Q801	8-729-402-55	2SB1218A-R

CT-38 (DIGITAL TITLER, CHARACTER GENERATOR) PRINTED WIRING BOARD

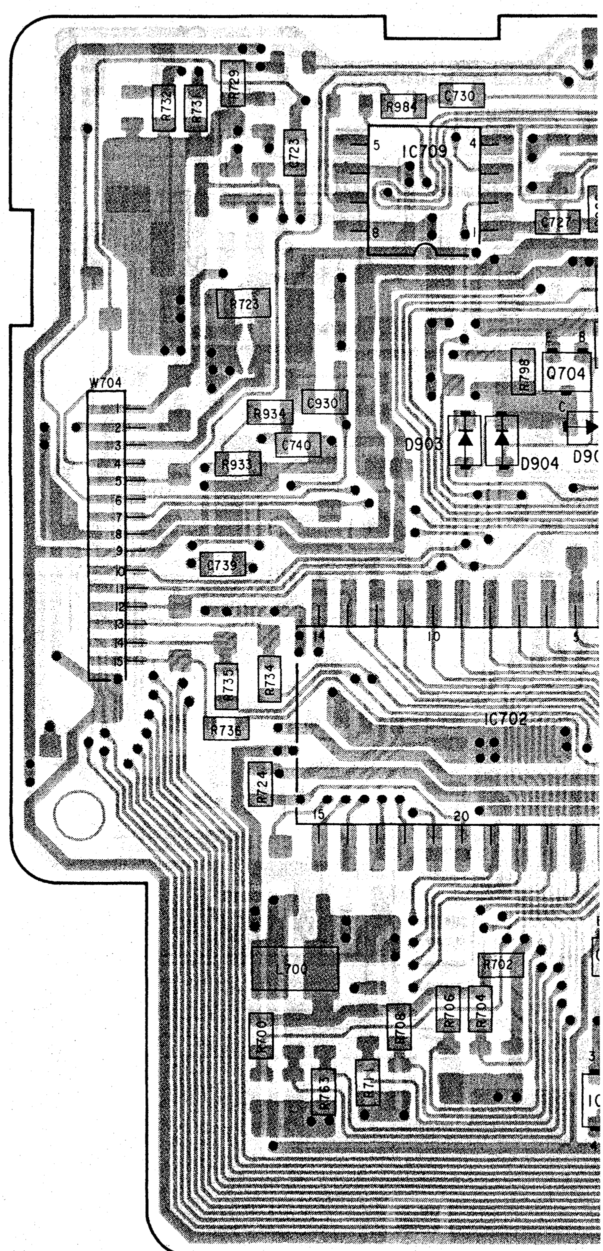
—Ref. No. CT-38 BOARD: 2000 series—

CT-38 BOARD (COMPONENT SIDE)

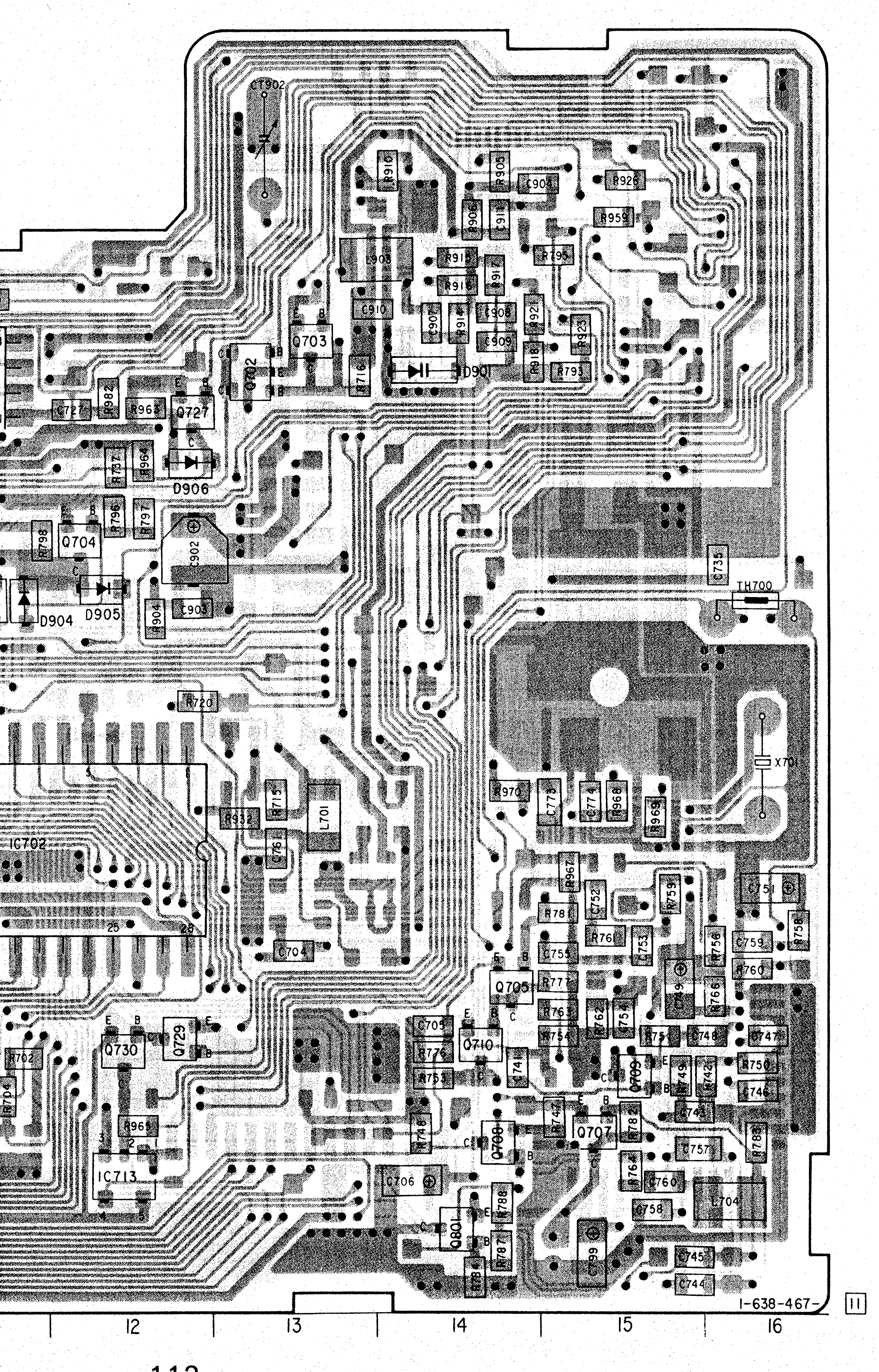


A
B
C
D
E
F
G
H
04
1
2
3
4
5
6
7
8
CN705
IC901
IC902
IC701
IC703
IC704
IC707
IC708
X703
Q706
Q728
Q726
Q800
Q720
Q701
CT701
CT702
CT901
L902
RV702
RV703

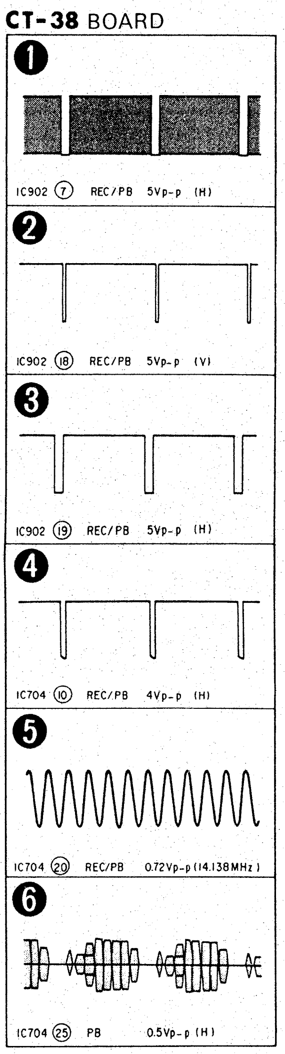
CT-38 BOARD (CONDUCTOR SIDE)



9
10
11
IC709
IC702
W704
D903
D904
Q704

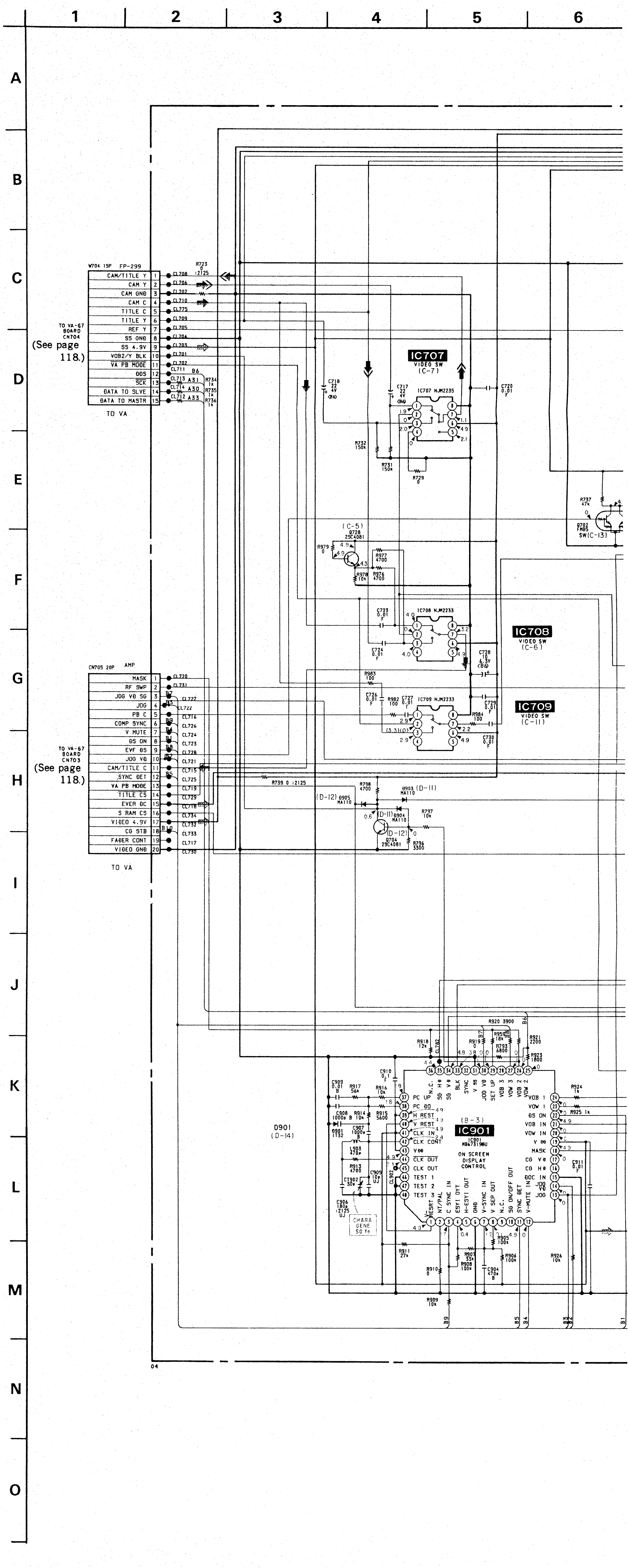

CT902
R916
R903
C903
R926
R959
R905
R915
R917
C910
C907
R914
R921
R923
R918
R793
Q703
R716
D901
Q702
C727
R982
R963
Q727
R737
R964
D906
R796
R797
R798
Q704
D904
D905
R904
C902
C905
C735
TH700
R720
X701
R970
C773
C774
R968
R969
R932
R715
L701
C761
IC702
R967
R781
C752
R761
C753
R759
C751
R758
C704
C755
C759
C760
Q705
R777
R763
R762
C754
R754
C749
R766
R756
C747
R750
C746
C748
R742
R749
C743
Q709
R782
Q710
C741
R776
R753
C705
C757
R764
C760
C704
Q730
Q729
R702
Q708
R748
Q707
R965
IC713
C706
R788
R787
Q801
R784
C799
C758
C745
C744
1-638-467-
11
12
13
14
15
16

CT-38 BOARD



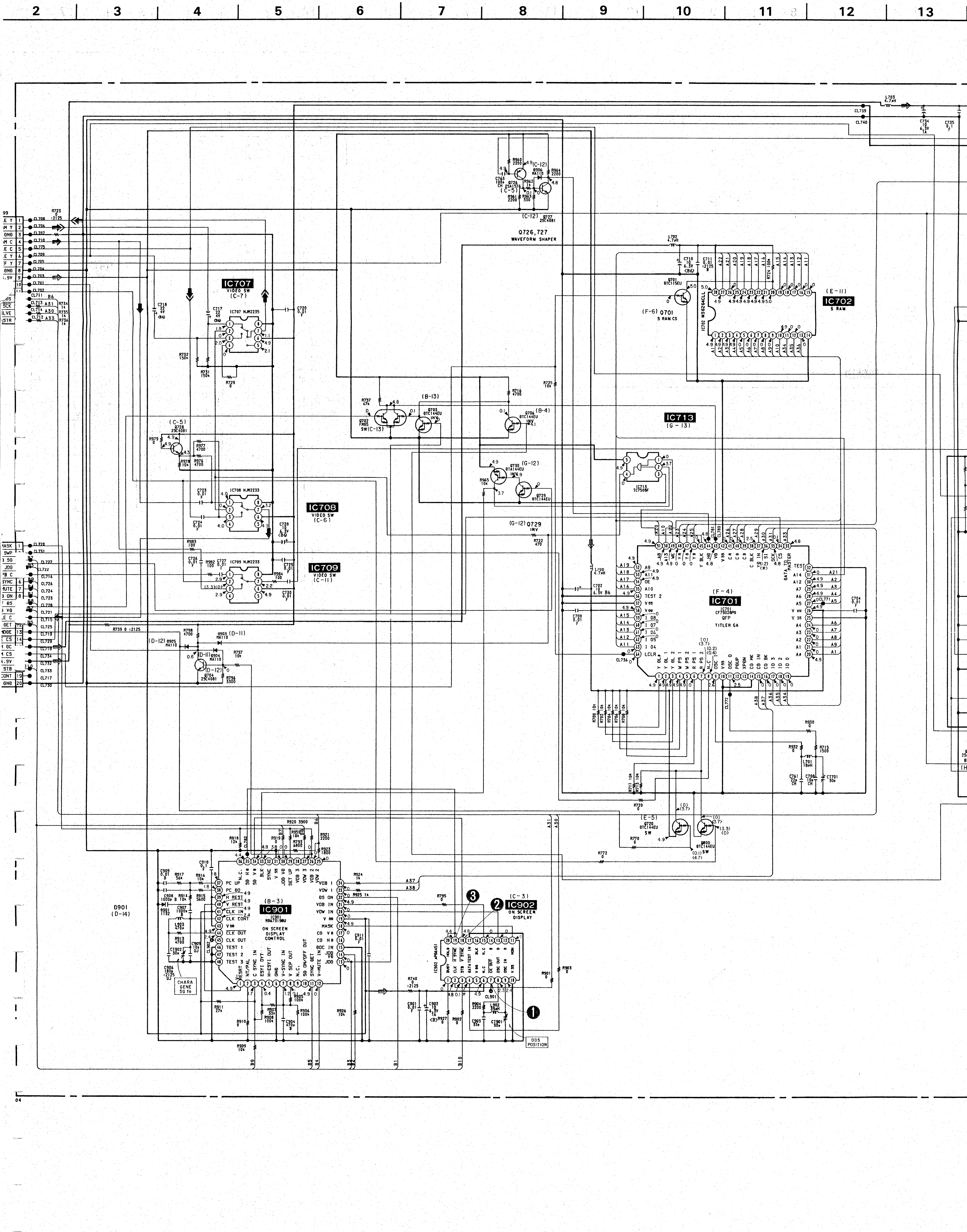
CT-38 (DIGITAL TITLER, CHARACTER GENERATOR) SCHEMATIC DIAGRAM

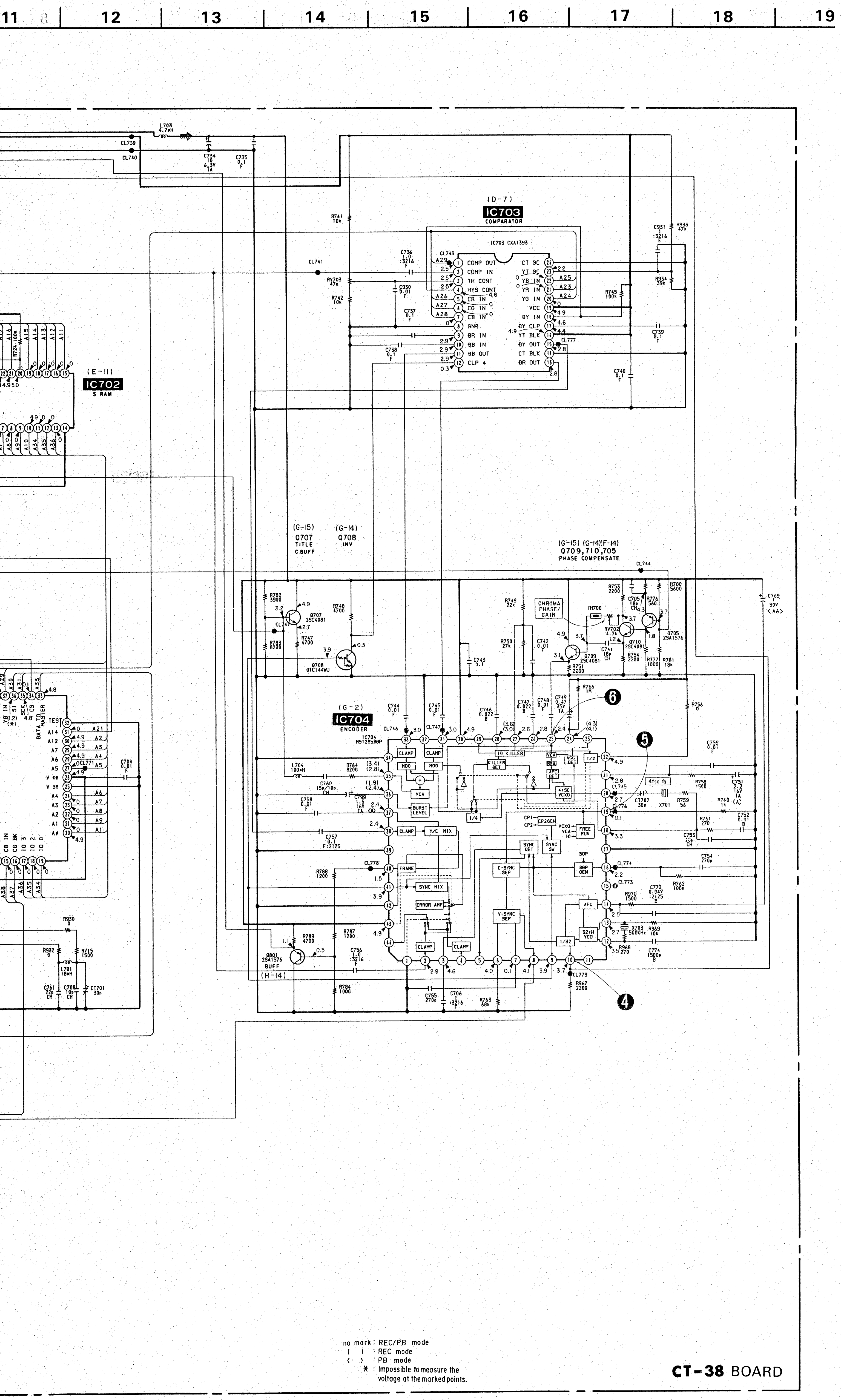
—Ref. No. CT-38 BOARD: 2000 series—


1
2
3
4
5
6
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
W704 15P FP-299
CAM/TITLE Y 1
CAM Y 2
CAM GND 3
CAM C 4
TITLE C 5
TITLE Y 6
REF Y 7
SS GND 8
SS 4.9V 9
VOB2/Y BLK 10
VA PB MODE 11
DOS 12
SCK 13
DATA TO SLVE 14
DATA TO MASTR 15
TO VA-67 BOARD CN704
(See page 118.)
TO VA
CL708
CL706
CL707
CL710
CL775
CL709
CL705
CL704
CL703
CL701
CL702
CL711
CL713
CL714
CL712
B6
A31
A30
A33
R723 0 :2125
R734 1k
R735 1k
R736 1k
CN705 20P AMP
MASK 1
RF SWP 2
JOG VD SG 3
JOG 4
PB C 5
COMP SYNC 6
V MUTE 7
DS ON 8
EVF DS 9
JOG VD 10
CAM/TITLE C 11
SYNC DET 12
VA PB MODE 13
TITLE CS 14
EVER DC 15
S RAM CS 16
VIDEO 4.9V 17
CG STB 18
FADER CONT 19
VIDEO GND 20
TO VA-67 BOARD CN703
(See page 118.)
TO VA
CL720
CL731
CL727
CL722
CL716
CL726
CL724
CL723
CL728
CL721
CL715
CL725
CL719
CL729
CL718
CL734
CL732
CL733
CL717
CL730
B7
B3
B9
B4
B1
B8
B2
B5
B10
IC707
VIDEO SW
(C-7)
IC707 NJM2235
IC708
VIDEO SW
(C-6)
IC708 NJM2233
IC709
VIDEO SW
(C-11)
IC709 NJM2233
Q728 2SC4081
(C-5)
Q704 2SC4081
(D-12)
Q702 FMG5 SW(C-13)
D903 (D-11) MA110
D905 MA110
D904 MA110
(D-12)
(D-11)
R739 0 :2125
D901 (D-14)
IC901
(B-3)
IC901 MB473190U
ON SCREEN DISPLAY CONTROL
CHARA GENE SG fs
RESRT
NT/PAL
C SYNC IN
ESYI DYT
H-ESYI OUT
GND
V-SYNC IN
V SEP OUT
N.C.
SG ON/OFF OUT
SYNC DET
V-MUTE IN
PC UP
PC DO
H REST
V REST
CLK IN
CLK CONT
VDD
CLK OUT
CLK OUT
TEST 1
TEST 2
TEST 3
N.C.
SG H
SG V
BLK
SYNC
V SS
JOG VD
SET UP
VOB 3
VOW 3
VOB 2
VOW 2
VOB 1
VOW 1
DS ON
VOB IN
VDW IN
V DD
MASK
CG V
CG H
DOC IN
JOG
B9
B5
B4
B1
04

ITLER, CHARACTER GENERATOR) SCHEMATIC DIAGRAM

OARD: 2000 series—


2
3
4
5
6
7
8
9
10
11
12
13
IC707
VIDEO SW
(C-7)
IC707 NJM2235
IC708
VIDEO SW
(C-6)
IC708 NJM2233
IC709
VIDEO SW
(C-11)
IC709 NJM2233
Q726,727
WAVEFORM SHAPER
Q702 FMG5 SW (C-13)
Q703 DTC144EU INV
Q706 DTC144EU INV (B-4)
Q730 DTA144EU INV (G-12)
Q729 DTC144EU
(G-12) Q729 INV
Q728 2SC4081 (C-5)
Q704 2SC4081 (D-12)
D903 MA110 (D-11)
D904 MA110 (D-11)
D905 MA110 (D-12)
IC713
(G-13)
IC713 TC7S08F
IC702
S RAM
(E-11)
IC702 MS6264CLL
(F-6) Q701
S RAM CS
Q701 DTC115EU
IC701
(F-4)
IC701 CF79028PG
QFP
TITLER GA
Q720 DTC144EU SW (E-5)
Q800 DTC144EU SW
IC901
(B-3)
IC901 MB67319BU
ON SCREEN DISPLAY CONTROL
IC902
(C-3)
ON SCREEN DISPLAY
IC902 μPD6451
CHARA GENE SG fo
D901
(D-14)
DDS POSITION
❶
❷
❸
L703 4.7μH
L702 4.7μH
L700 4.7μH
L701 18μH
CL739
CL740
A30
A31
A37
A38
B1
B2
B3
B4
B5
B9
B10

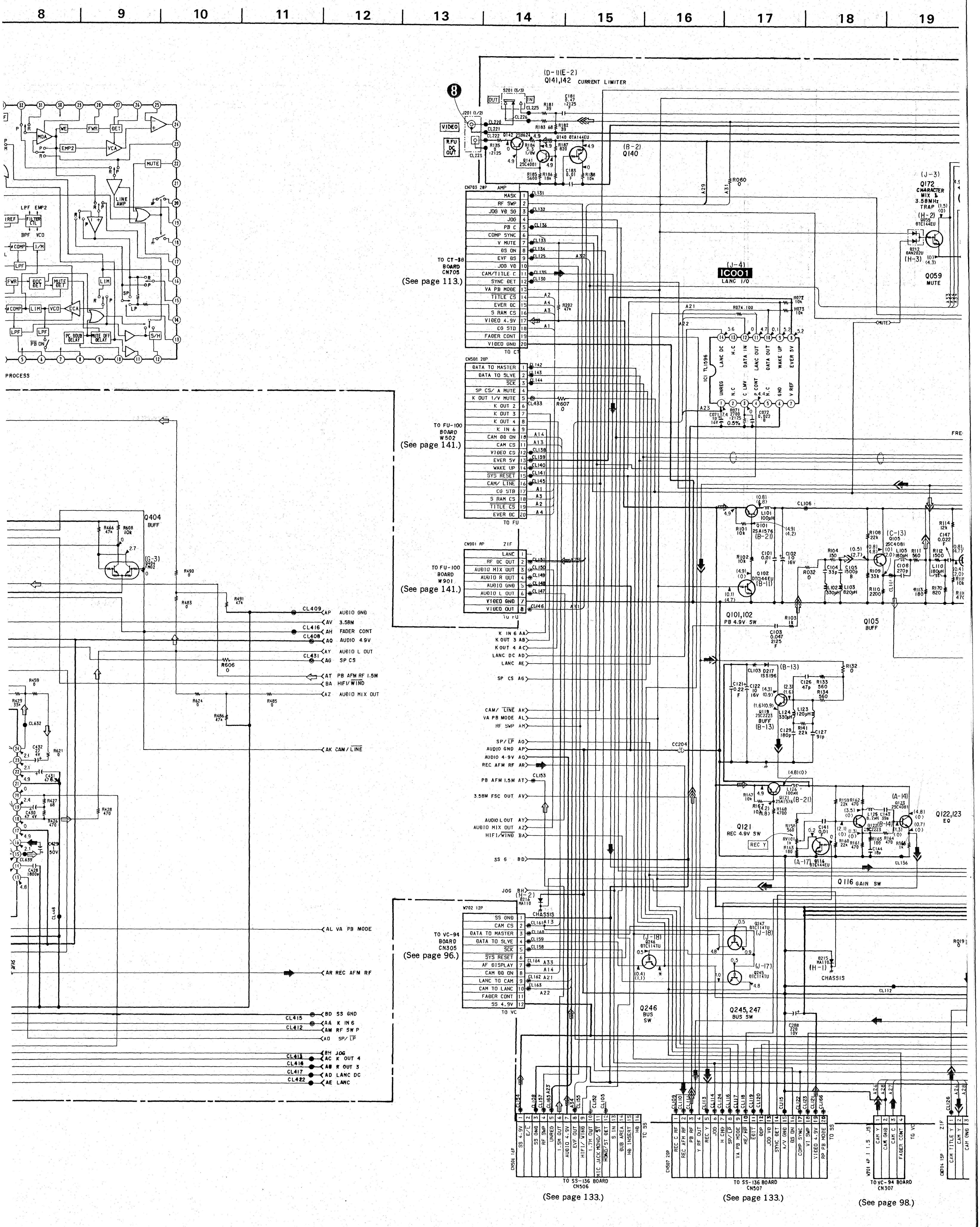

11
12
13
14
15
16
17
18
19
(D-7)
IC703
COMPARATOR
IC703 CXA1393
COMP OUT
COMP IN
TH CONT
HYS CONT
CR IN
CG IN
CB IN
GND
BR IN
BB IN
BB OUT
CLP 4
CT GC
YT GC
YB IN
YR IN
YG IN
VCC
BY IN
BY CLP
YT BLK
BY OUT
CT BLK
BR OUT
(E-11)
IC702
S RAM
(G-15)
Q707
TITLE
C BUFF
(G-14)
Q708
INV
(G-15) (G-14)(F-14)
Q709,710,705
PHASE COMPENSATE
CHROMA PHASE/ GAIN
(G-2)
IC704
ENCODER
IC704 M51285BOP
CLAMP
MOD
VCA
BURST LEVEL
Y/C MIX
FRAME
SYNC MIX
ERROR AMP
C-SYNC SEP
V-SYNC SEP
SYNC DET
SYNC SW
KILLER DET
CP2GEN
VCXO
FREE RUN
BOP DEN
AFC
32fH VCO
1/32
1/2
1/4
4fsc VCXO
4fsc fo
Q801 2SA1576 BUFF
(H-14)
DATA TO MASTER
TEST
CG IN
CG BK
❹
❺
❻

no mark : REC/PB mode
( ) : REC mode
( ) : PB mode
✱ : Impossible to measure the voltage at the marked points.

CT-38 BOARD

• **Signal path**

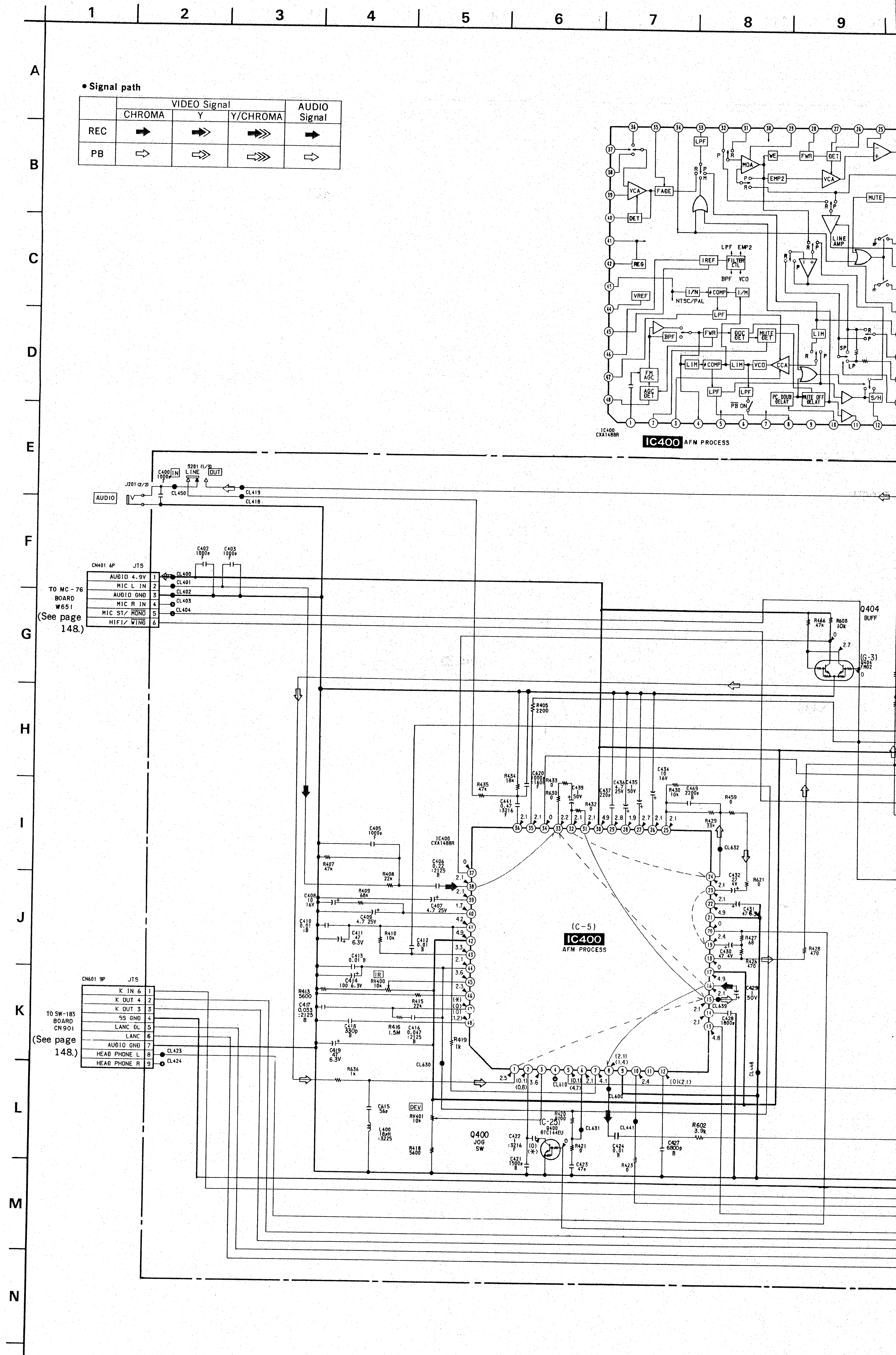
	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	⇛	⋙


8 9 10 11 12 13 14 15 16 17 18 19
(D-11)(E-2) Q141,142 CURRENT LIMITER
(B-2) Q140
VIDEO
RFU DC OUT
J201 (1/2)
S201 (3/3)
(J-3) Q172 CHARACTER MIX & 3.58MHz TRAP
(H-2) Q059
(H-3) D212
Q059 MUTE
(J-4) IC001 LANC I/O
IC1 TL1596
LANC DC
H.C
DATA IN
LANC OUT
DATA OUT
WAKE UP
EVER 5V
UNREG
N.C
C LNV
CONT
GND
V REF
CN703 20P AMP
MASK
RF SWP
JOG VD SO
JOG
PB C
COMP SYNC
V MUTE
DS ON
EVF DS
JOG VD
CAM/TITLE C
SYNC DET
VA PB MODE
TITLE CS
EVER DC
S RAM CS
VIDEO 4.9V
CG STD
FADER CONT
VIDEO GND
TO CT
TO CT-38 BOARD CN705 (See page 113.)
CN508 20P
DATA TO MASTER
DATA TO SLVE
SCK
SP CS/ A MUTE
K OUT 1/V MUTE
K OUT 2
K OUT 3
K OUT 4
K IN 6
CAM DD ON
CAM CS
VIDEO CS
EVER 5V
WAKE UP
SYS RESET
CAM/ LINE
CG STB
S RAM CS
TITLE CS
EVER DC
TO FU
TO FU-100 BOARD W502 (See page 141.)
CN901 8P ZIF
LANC
RF DC OUT
AUDIO MIX OUT
AUDIO R OUT
AUDIO GND
AUDIO L OUT
VIDEO GND
VIDEO OUT
TO FU-100 BOARD W901 (See page 141.)
Q101,102 PB 4.9V SW
Q105 BUFF
Q119 BUFF (B-13)
Q121 REC 4.9V SW
REC Y
Q122,123 EQ
Q116 GAIN SW
Q404 BUFF
(G-3)
AUDIO GND
3.58M
FADER CONT
AUDIO 4.9V
AUDIO L OUT
SP CS
PB AFM RF 1.5M
HIFI/WIND
AUDIO MIX OUT
CAM/LINE
VA PB MODE
REC AFM RF
SS GND
K IN 6
RF SW P
SP/LP
JOG
K OUT 4
K OUT 3
LANC DC
LANC
K IN 6 AA
K OUT 3 AB
K OUT 4 AC
LANC DC AD
LANC AE
SP CS AG
CAM/ LINE AK
VA PB MODE AL
HF SWP AM
SP/LP AO
AUDIO GND AP
AUDIO 4.9V AQ
REC AFM RF AR
PB AFM 1.5M AT
3.58M FSC OUT AV
AUDIO L OUT AY
AUDIO MIX OUT AZ
HIFI/WIND BA
SS G BD
JOG BH
(H-2) D216 MA110
CHASSIS
W702 12P
SS GND
CAM CS
DATA TO MASTER
DATA TO SLVE
SCK
SYS RESET
AF DISPLAY
CAM DD ON
LANC TO CAM
CAM TO LANC
FADER CONT
SS 4.9V
TO VC
TO VC-94 BOARD CN305 (See page 96.)
(J-18) Q246
Q246 BUS SW
(J-18) Q247
(J-17) Q245
Q245,247 BUS SW
(H-1) D215 MA110
CHASSIS
CN504 16P
SS 4.9V
E/C
SS GND
RF SWP
UNREG
1.5M OUT
AUDIO 4.9V
EVF OUT
HIFI/WIND
1.7M OUT
MIC JACK MONO/ST
MONO/ST DET
S IN
DUB AREA
HB INSERT
HB
TO SS
TO SS-136 BOARD CN506 (See page 133.)
CN507 20P
REC C RF
REC AFM RF
PB RF
Y RF OUT
REC Y
JOG
H CH9
SP/LP
VA PB MODE
HE/HP
EDIT
DDP
JOG VD
SYNC DET
A/V GND
DS ON
COMP SYNC
VI SWP
VIDEO 4.9V
RP PB MODE
TO SS
TO SS-136 BOARD CN507 (See page 133.)
V701 4P 1.5 J3
CAM Y
CAM GND
CAM C
FADER CONT
TO VC
TO VC-94 BOARD CN307 (See page 98.)
CN704 15P ZIF
CAM TITLE Y
CAM Y
CAM GND
LPF EMP2
BPF VCO
MOA
WE
FWR
DET
VCA
EMP2
MUTE
LINE AMP
FILTER CTL
COMP
LPF
LIM
DOC DET
MUTE DET
VCO
CCA
PB ON
PC DOUB DELAY
MUTE OFF DELAY
S/H
PROCESS

VA-67 (VIDEO/AUDIO) SCHEMATIC DIAGRAM
—Ref. No. VA-67 BOARD : 2000 series—

• **Signal path**

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨



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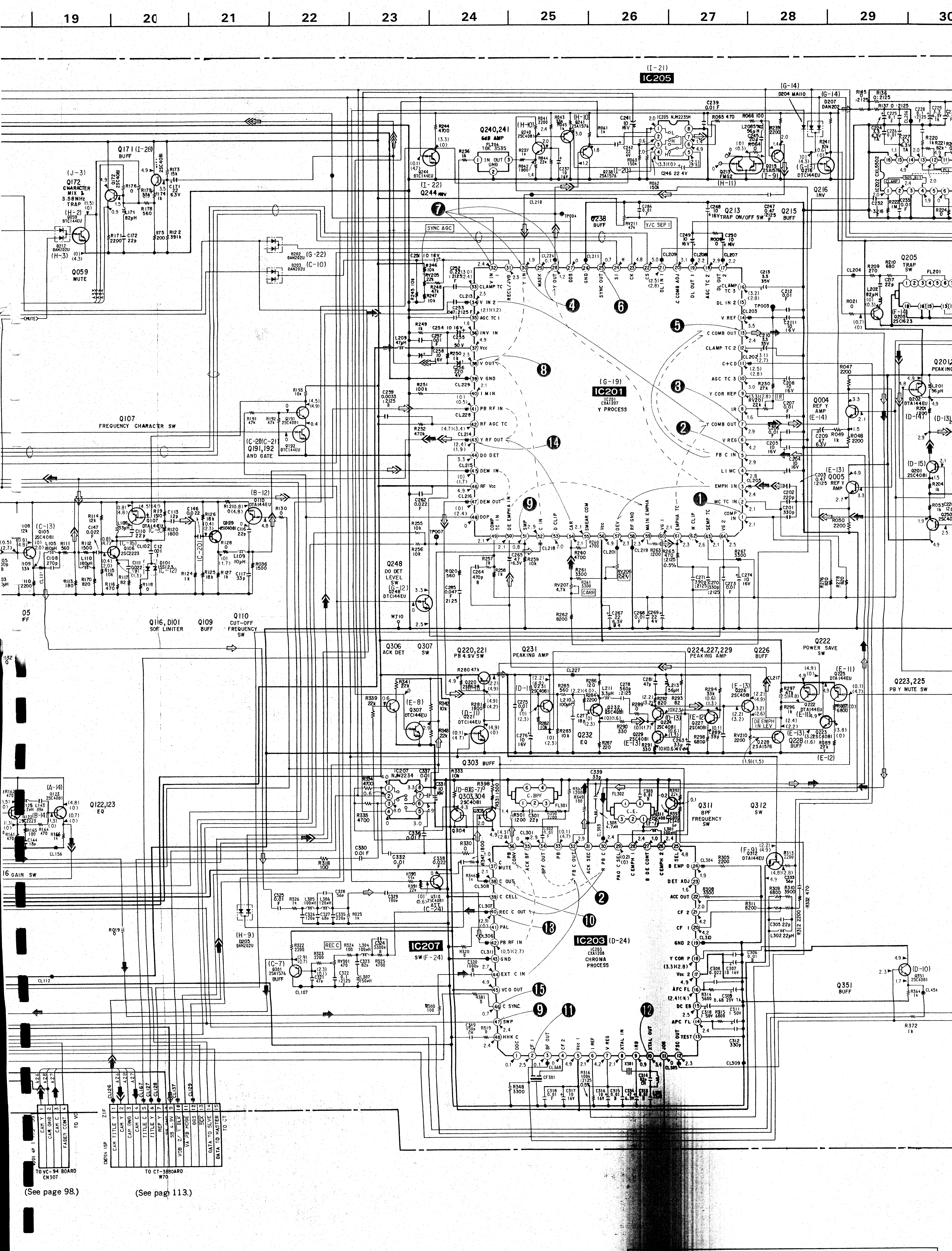
I
J
K
L
M
N
O
IC400 CXA1488R
IC400 AFM PROCESS
(C-5)
J201 (2/2)
AUDIO
C400 1000p
S201 (1/2) LINE IN OUT
CL419
CL418
CL450
C402 1000p
C403 1000p
CN401 6P JTS
AUDIO 4.9V 1
MIC L IN 2
AUDIO GND 3
MIC R IN 4
MIC ST/ MONO 5
HIFI/ WIND 6
CL400
CL401
CL402
CL403
CL404
TO MC-76 BOARD W651 (See page 148.)
CN601 9P JTS
K IN 6 1
K OUT 4 2
K OUT 3 3
SS GND 4
LANC DL 5
LANC 6
AUDIO GND 7
HEAD PHONE L 8
HEAD PHONE R 9
CL423
CL424
TO SW-183 BOARD CN901 (See page 148.)
Q404 BUFF
(G-3)
Q400 JOG SW
Q400 DTC144EU
(C-2)
LPF EMP2
BPF VCO
NTSC/PAL
VCA
FADE
DET
REG
IREF
VREF
MOA
WE
FWR
EMP2
MUTE
LINE AMP
LIM
BPF
FM AGC
AGC DET
DOC DET
MUTE DET
COMP
VCO
CCA
PC DOUB DELAY
MUTE OFF DELAY
PB ON
S/H
SP
LP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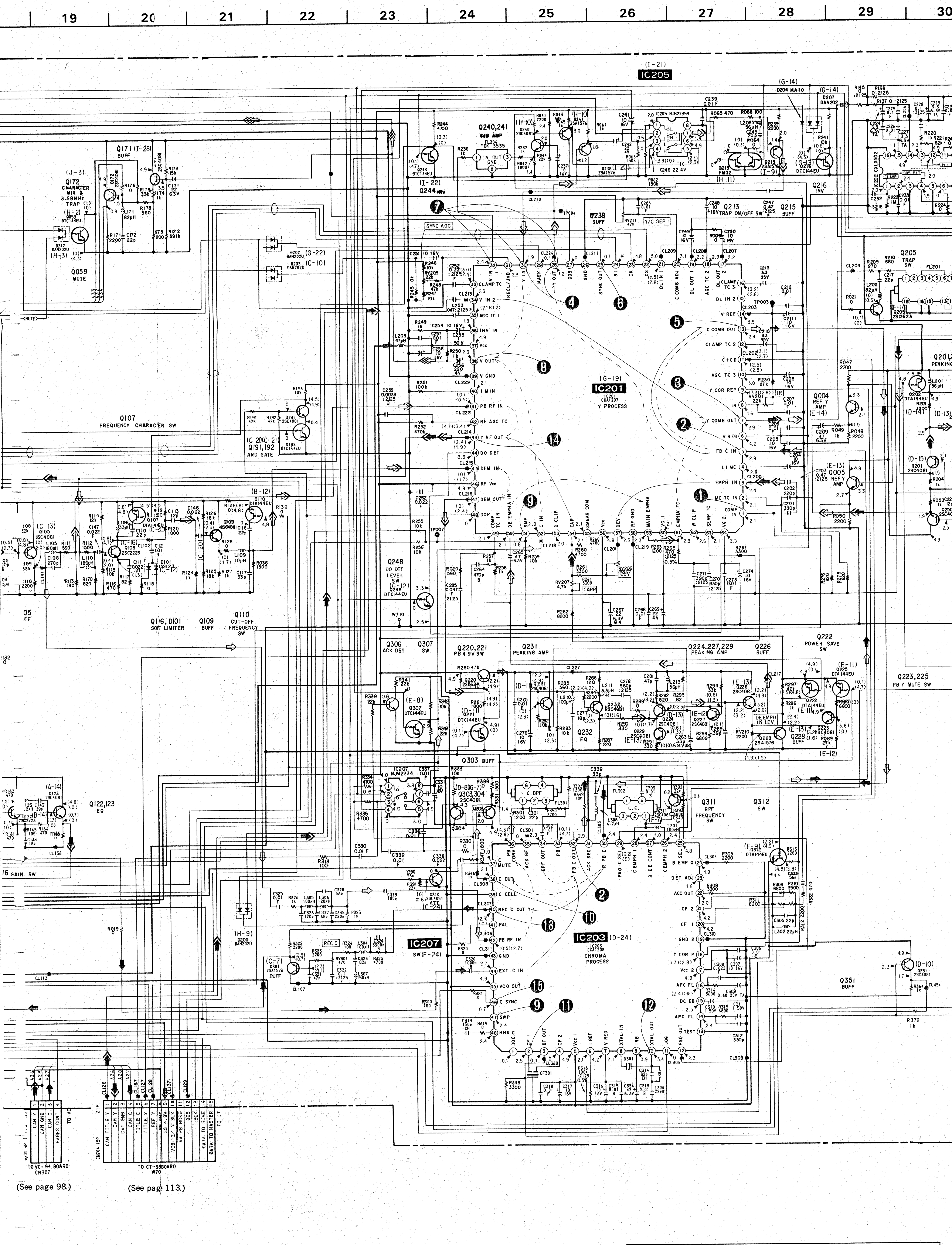
IC205
IC201
(G-19)
CXA1207
Y PROCESS
IC203
(D-24)
CXA1208
CHROMA PROCESS
IC207
SW(F-24)
IC207 NJM2234
Q172 CHARACTER MIX & 3.58MHz TRAP
Q171 (I-28) BUFF
Q059 MUTE
Q240,241 64B AMP
Q244
Q213 TRAP ON/OFF SW
Q215 BUFF
Q216 INV
Q205 TRAP SW
Q238 BUFF
Q107 FREQUENCY CHARACTER SW
Q191,192 AND GATE
Q116, D101 SOF LIMITER
Q109 BUFF
Q110 CUT-OFF FREQUENCY SW
Q248 DO DET LEVEL SW
Q004 REF Y AMP
Q005 REF Y AMP
Q306 ACK DET
Q307 SW
Q220,221 PB 4.9V SW
Q231 PEAKING AMP
Q232 EQ
Q224,227,229 PEAKING AMP
Q226 BUFF
Q222 POWER SAVE SW
Q223,225 PB Y MUTE SW
Q228 BUFF
Q303 BUFF
Q303,304
Q311 BPF FREQUENCY SW
Q312 SW
Q122,123 EQ
Q301 BUFF
Q351 BUFF
SYNC AGC
Y/C SEP I
DE EMPH IN LEV
C.BPF
C.E.
REC C
CARR
16 GAIN SW
CAM Y
CAM GND
CAM C
FADER CONT
TG VC
CAM TITLE Y
TITLE C
TITLE Y
REF Y
SS 4.9V
VDB 2/V BLK
VA PB MODE
86S
SCK
DATA TO SLVE
DATA TO MASTER
TO CT
TO VC-94 BOARD CN307
(See page 98.)
CM704 15P
ZIF
TO CT-38BOARD W70
(See page 113.)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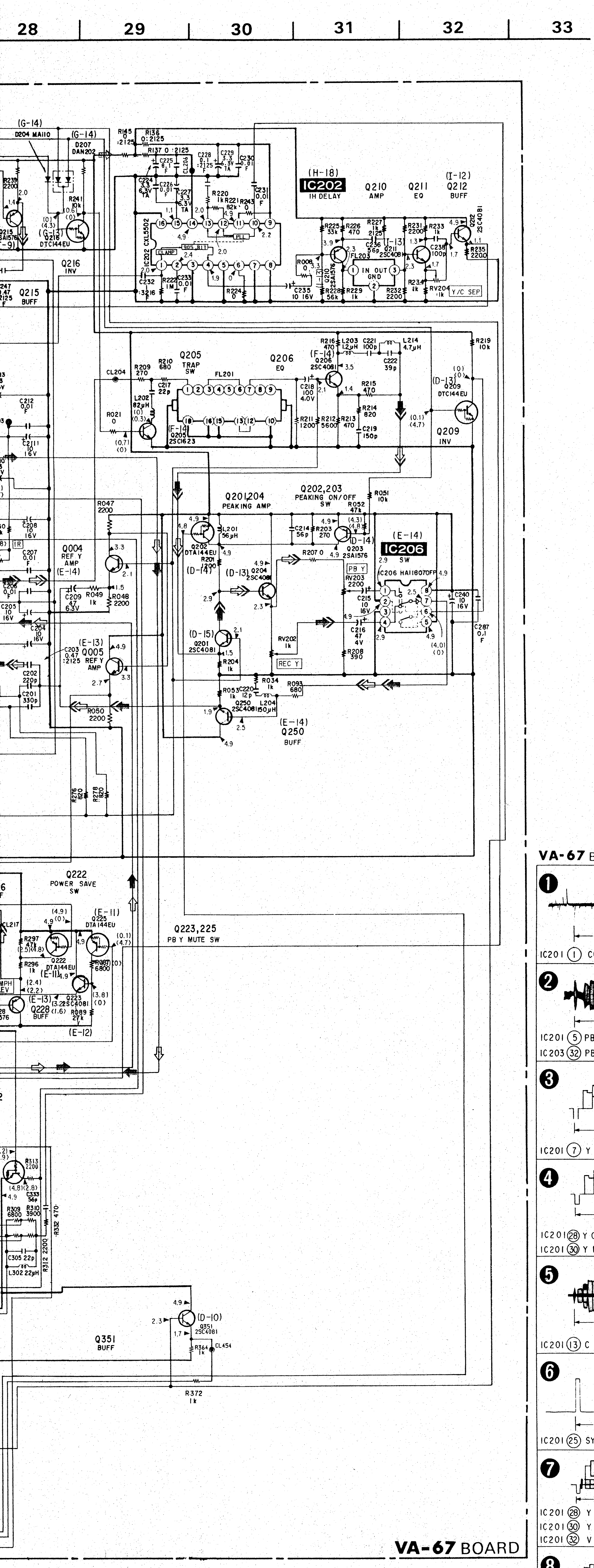
(I-21)
IC205
Q171 (I-28) BUFF
Q172 CHARACTER MIX & 3.58MHz TRAP
Q059 MUTE
Q240,241 6dB AMP
Q244
Q216 INV
Q215 BUFF
Q213 TRAP ON/OFF SW
Q238 BUFF
Y/C SEP I
SYNC AGC
Q205 TRAP SW
Q107 FREQUENCY CHARACTER SW
Q191,192 AND GATE
(G-19)
IC201
CXA1207
Y PROCESS
Q004 REF Y AMP
Q0005 REF Y AMP
Q201 REF Y AMP
Q202 PEAKING
Q248 DO DET LEVEL SW
Q105 FF
Q116, D101 SOF LIMITER
Q109 BUFF
Q110 CUT-OFF FREQUENCY SW
Q306 ACK DET
Q307 SW
Q220,221 PB 4.9V SW
Q231 PEAKING AMP
Q232 EQ
Q224,227,229 PEAKING AMP
Q226 BUFF
Q222 POWER SAVE SW
Q223,225 PB Y MUTE SW
Q228 BUFF
Q303 BUFF
Q303,304
Q311 BPF FREQUENCY SW
Q312 SW
Q122,123 EQ
Q310 ATT
IC207 NJM2234 SW (F-24)
IC203 (D-24)
CXA1208
CHROMA PROCESS
Q301 BUFF
Q351 BUFF
C.BPF
C.E.
CAM Y
CAM GND
CAM C
FADER CONT
TO VC-94 BOARD CN307
TG VC
CN704 15P
CAM TITLE Y
TITLE C
TITLE Y
REF Y
SS 4.9V
VOB 2/Y BLK
VA PB MODE
BGS
SCK
DATA TO SLVE
DATA TO MASTER
TO CT
TO CT-388BOARD W70
(See page 98.)
(See page 113.)


28
29
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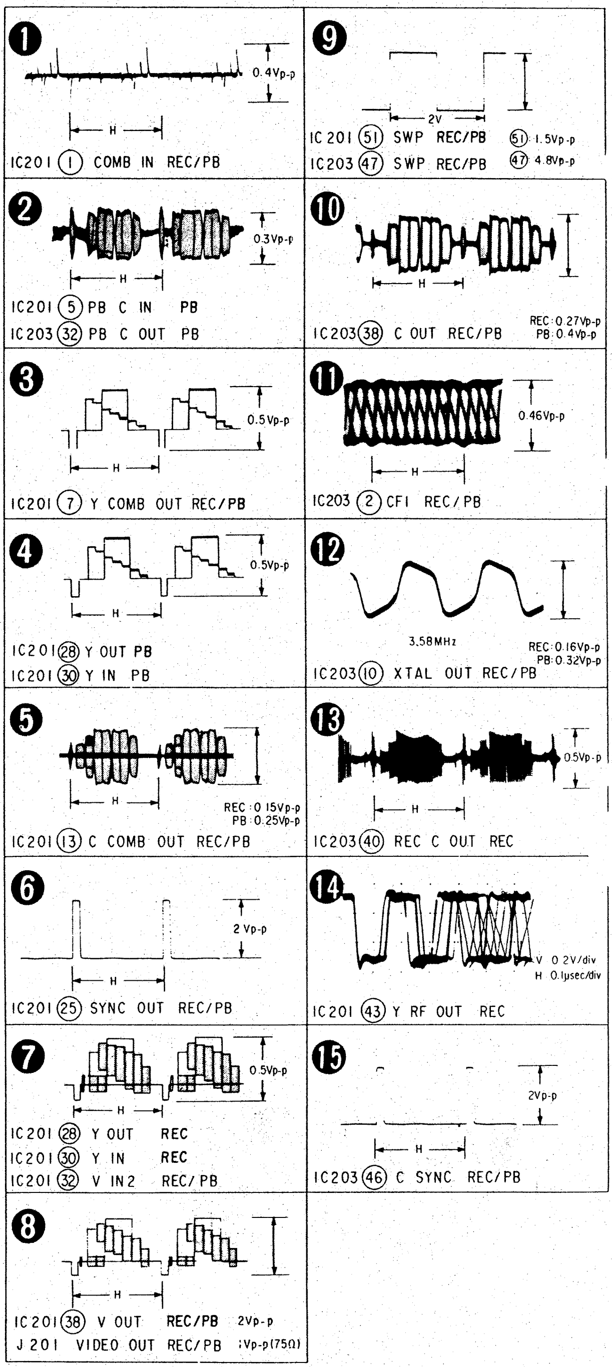
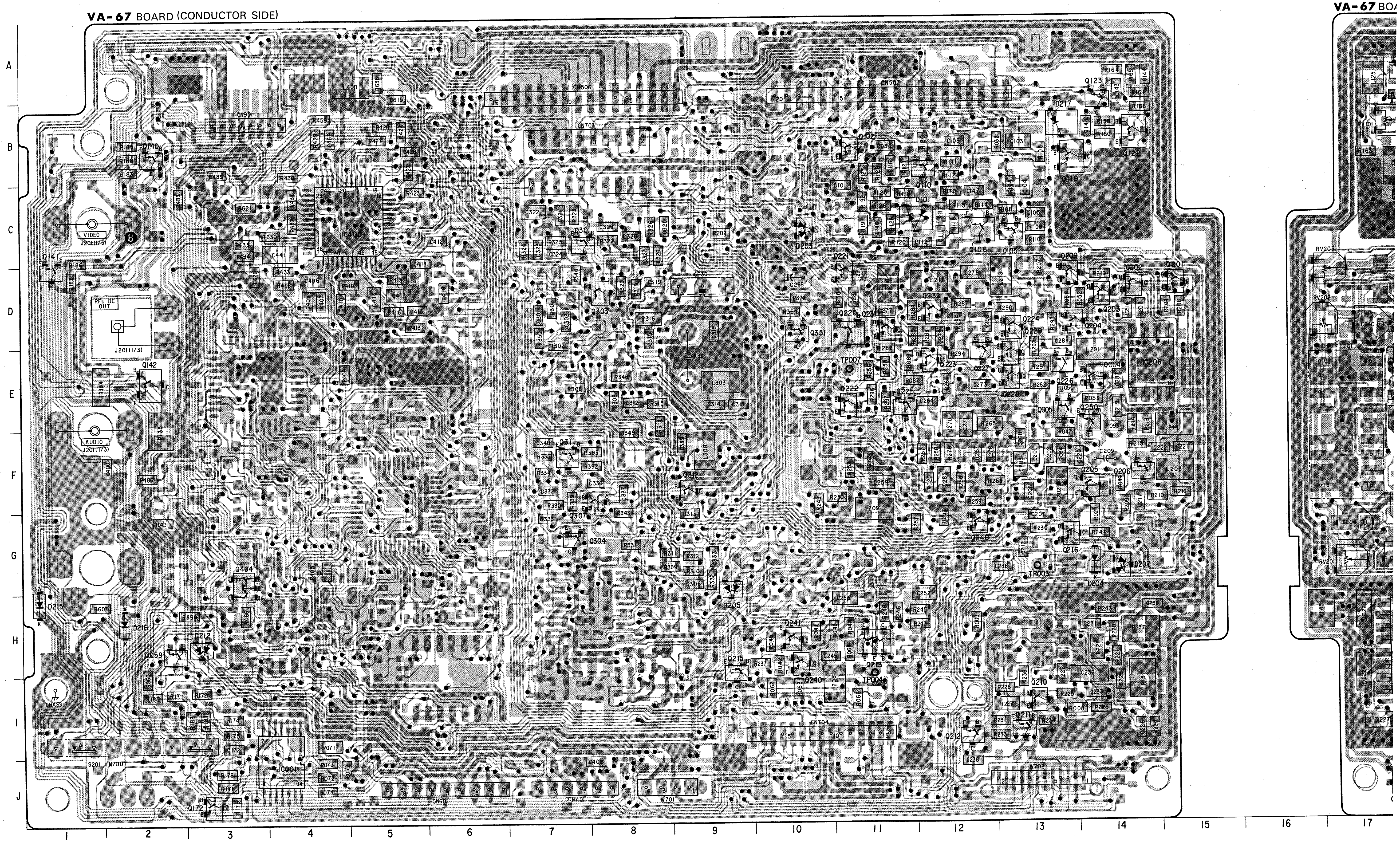
31
32
33
(H-18)
IC202
1H DELAY
Q210
AMP
Q211
EQ
(I-12)
Q212
BUFF
IC202 CXL5502
Y/C SEP
Q205
TRAP
SW
FL201
Q206
EQ
Q209
INV
Q201,204
PEAKING AMP
Q202,203
PEAKING ON/OFF
SW
(E-14)
IC206
IC206 HA11807OFP
PB Y
REC Y
Q004
REF Y
AMP
Q005
REF Y
AMP
(E-14)
Q250
BUFF
Q215
BUFF
Q216
INV
Q222
POWER SAVE
SW
Q223,225
PB Y MUTE SW
Q351
BUFF
VA-67 BOARD

VA-67 BOARD


1
0.4Vp-p
H
IC201 ① COMB IN REC/PB
2
0.3Vp-p
IC201 ⑤ PB C IN PB
IC203 ㉜ PB C OUT PB
3
0.5Vp-p
IC201 ⑦ Y COMB OUT REC/PB
4
0.5Vp-p
IC201 ㉘ Y OUT PB
IC201 ㉚ Y IN PB
5
REC 0.15Vp-p
PB 0.25Vp-p
IC201 ⑬ C COMB OUT REC/PB
6
2Vp-p
IC201 ㉕ SYNC OUT REC/PB
7
0.5Vp-p
IC201 ㉘ Y OUT REC
IC201 ㉚ Y IN REC
IC201 ㉜ V IN2 REC/PB
8
IC201 ㊳ V OUT REC/PB 2Vp-p
J201 VIDEO OUT REC/PB 1Vp-p(75Ω)
9
2V
IC201 (51) SWP REC/PB (51) 1.5Vp-p
IC203 ㊼ SWP REC/PB ㊼ 4.8Vp-p
10
REC 0.27Vp-p
PB 0.4Vp-p
IC203 ㊳ C OUT REC/PB
11
0.46Vp-p
IC203 ② CFI REC/PB
12
3.58MHz
REC 0.16Vp-p
PB 0.32Vp-p
IC203 ⑩ XTAL OUT REC/PB
13
0.5Vp-p
IC203 ㊵ REC C OUT REC
14
V 0.2V/div
H 0.1μsec/div
IC201 ㊸ Y RF OUT REC
15
2Vp-p
IC203 ㊻ C SYNC REC/PB

VA-67 (VIDEO/AUDIO) PRINTED WIRING BOARD

—Ref. No. VA-67 BOARD : 2000 series—


VA-67 BOARD (CONDUCTOR SIDE)
VA-67 BO
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I
J
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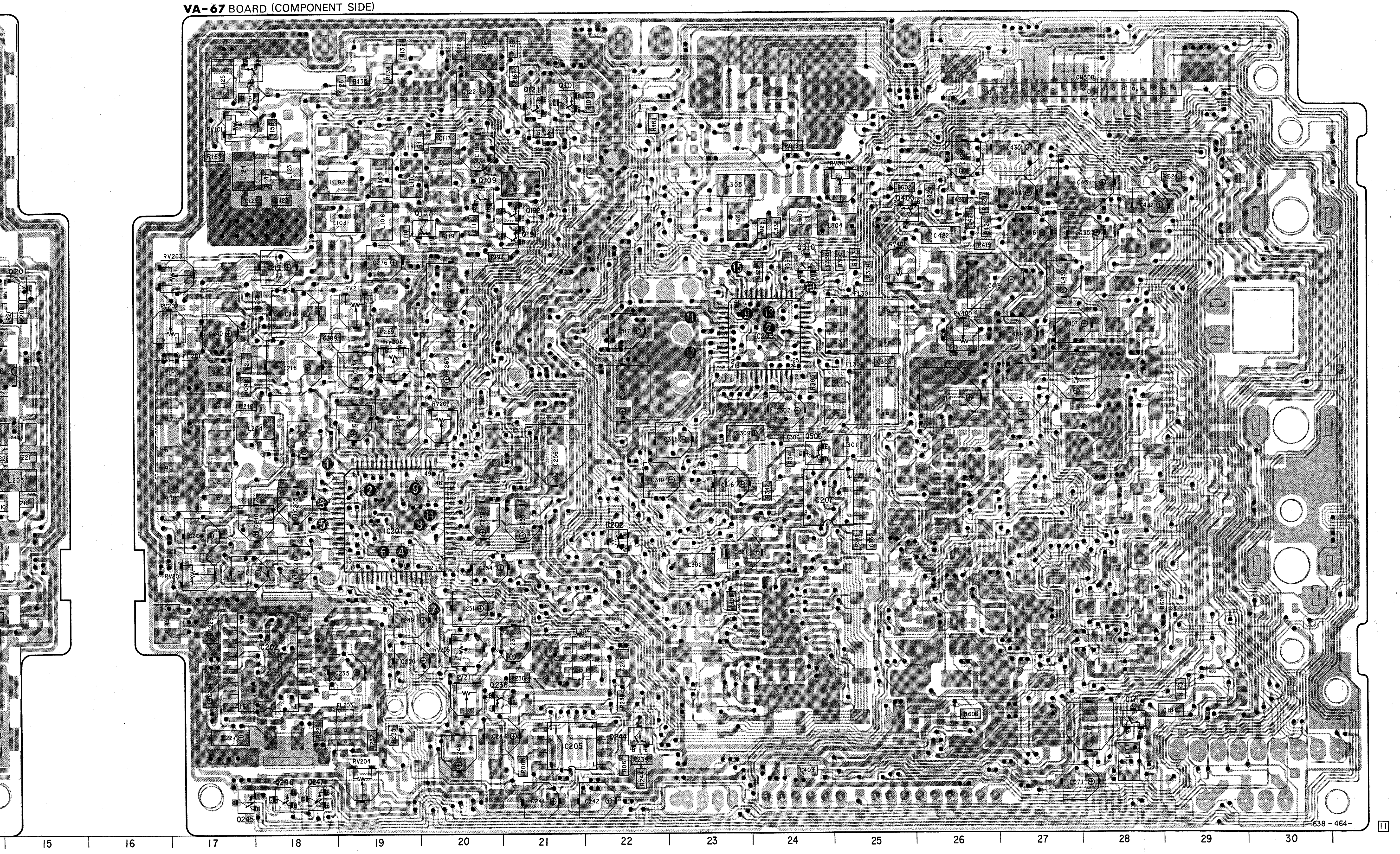
VIDEO
J201(1/3)
RFU DC OUT
J201(1/3)
AUDIO
J201(1/3)
CHASSIS
S201 (N/OUT)
CN901
CN506
CN507
CN703
CN704
CN601
CN401
W701
W702
IC400
IC206
IC001
X301
TP003
TP004
TP007
RV201
RV202
RV203

04

VA-67 BOARD (COMPONENT SIDE)


IC201
IC202
IC203
IC205
IC207
D202
CN508
FL201
FL203
FL204
FL301
FL302
RV101
RV201
RV203
RV204
RV205
RV206
RV207
RV210
RV211
RV301
RV400
RV401
1-638-464-11
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< DIO
D101
D202
D203
D204
D205

D207
D212
D215
D216
D217

< IC
IC001
IC201
IC202
IC203
IC205

IC206
IC207
IC400

< TR
Q004
Q005
Q059
Q101
Q102

Q105
Q106
Q107
Q109
Q110

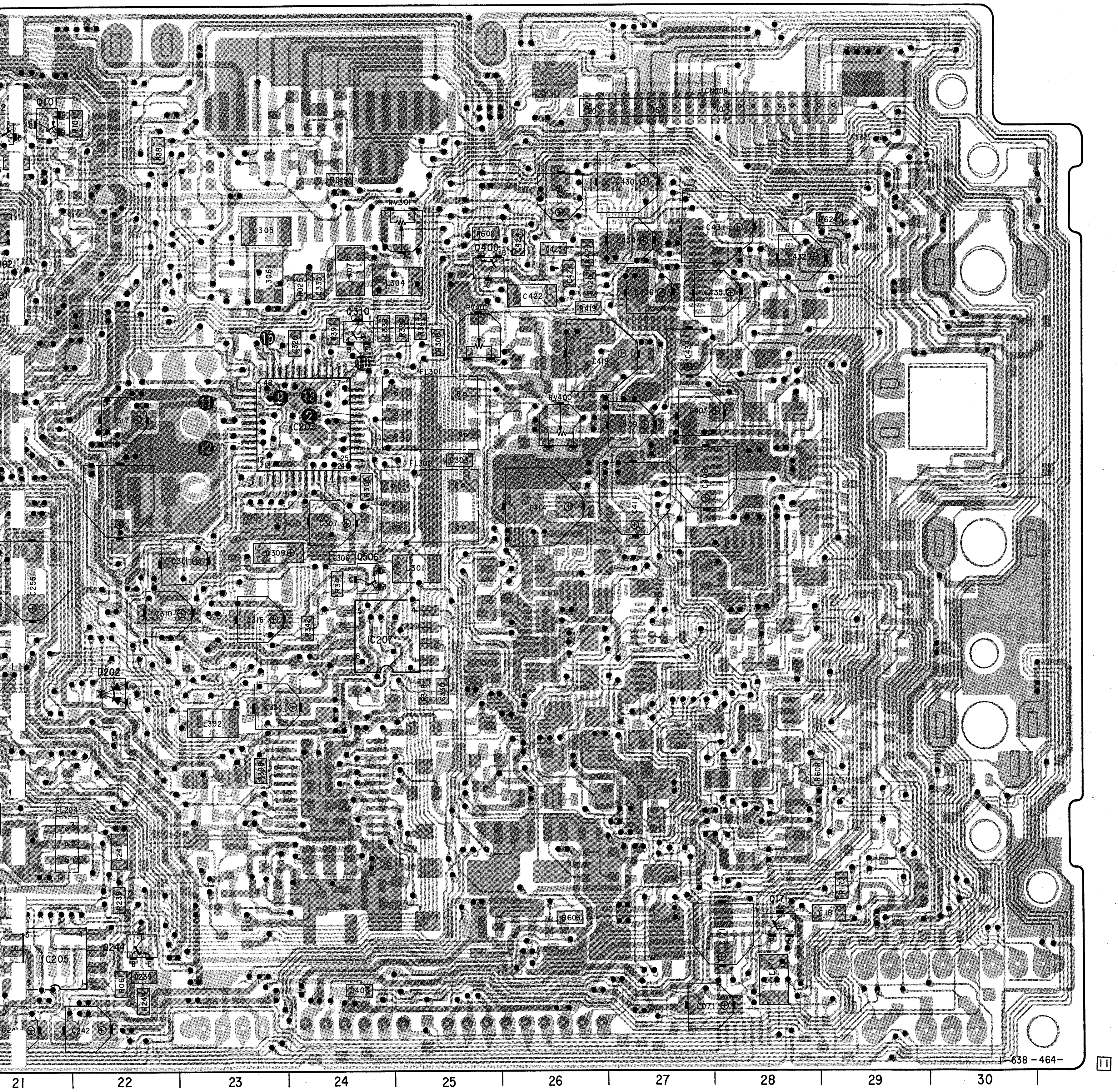
Q116
Q119
Q121
Q122
Q123

Q140
Q141
Q142
Q171
Q172

Q191
Q192
Q201
Q202
Q203

Q204
Q205
Q206
Q209
Q210

Q211
Q212
Q213
Q215
Q216


Q101
C317
IC203
C307
C309
C310
C316
C256
D202
L302
L305
L306
L304
RV301
Q310
FL301
FL302
C308
L301
IC207
C351
Q400
C422
RV401
RV400
C430
C431
C432
C434
C435
C436
C419
C414
C407
C409
C408
CN508
R608
R606
Q171
C18
C071
C403
FL204
IC205
Q244
C239
C242
R624
R602
R419
638-464-
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< DIODE >

D101	8-719-800-76	1SS226
D202	8-719-941-86	DAN202U
D203	8-719-941-86	DAN202U
D204	8-719-404-46	MA110
D205	8-719-941-86	DAN202U
D207	8-719-941-86	DAN202U
D212	8-719-941-86	DAN202U
D215	8-719-404-46	MA110
D216	8-719-404-46	MA110
D217	8-719-801-41	1SS196

< IC >

IC001	8-759-999-02	TL1596CDB
IC201	8-752-036-19	CXA1207R
IC202	8-752-332-68	CXL5502M
IC203	8-752-036-20	CXA1208R
IC205	8-759-710-29	NJM2235M
IC206	8-759-320-76	HA118070FP
IC207	8-759-710-07	NJM2234M
IC400	8-759-823-19	CXA-1488R

< TRANSISTOR >

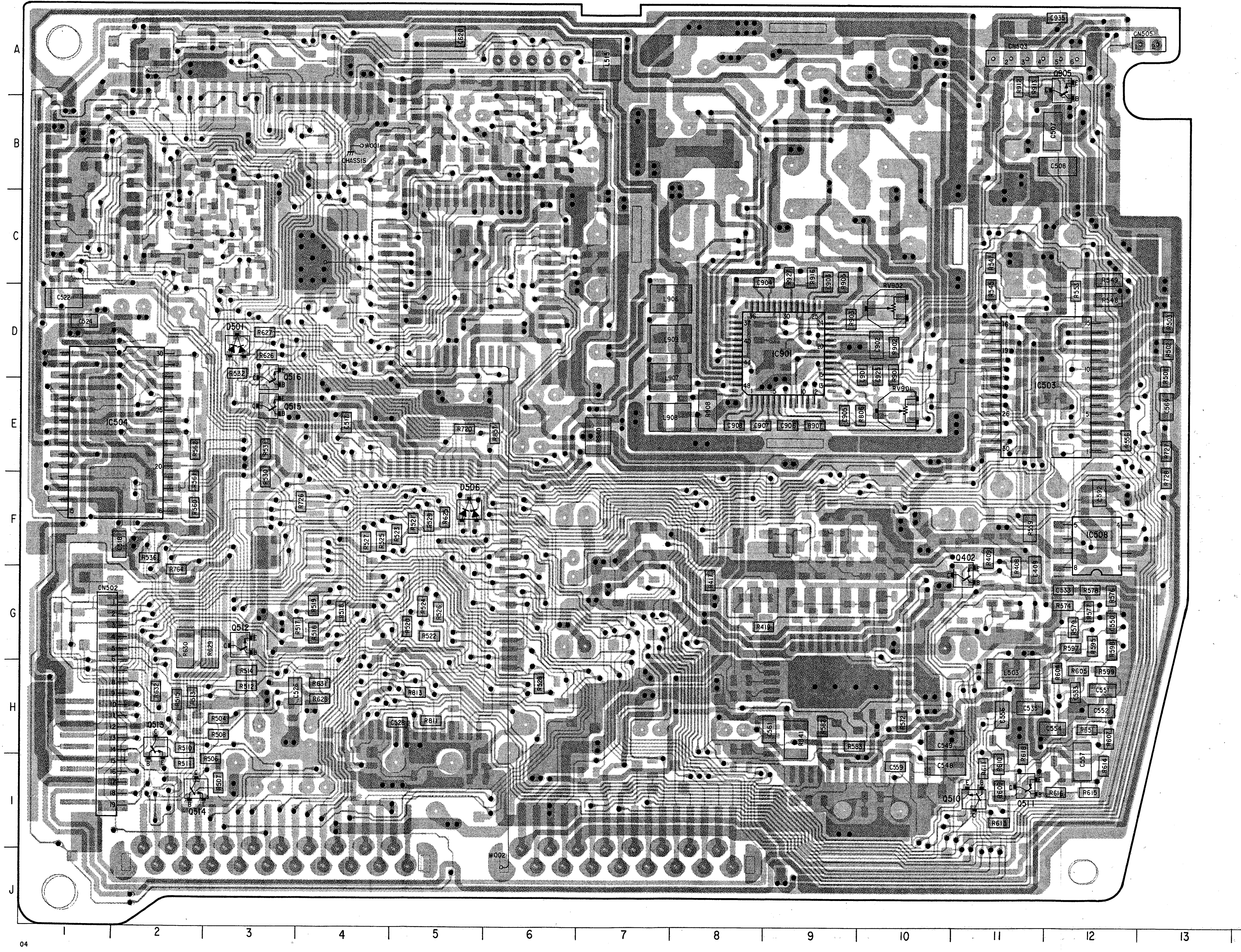
Q004	8-729-905-35	2SC4081-R
Q005	8-729-905-35	2SC4081-R
Q059	8-729-905-18	DTC144EU
Q101	8-729-905-23	2SA1576-R
Q102	8-729-905-18	DTC144EU
Q105	8-729-905-35	2SC4081-R
Q106	8-729-102-07	2SC2223-F13
Q107	8-729-905-12	DTA144EU
Q109	8-729-905-35	2SC4081-R
Q110	8-729-905-12	DTA144EU
Q116	8-729-905-18	DTC144EU
Q119	8-729-102-07	2SC2223-F13
Q121	8-729-905-23	2SA1576-R
Q122	8-729-102-07	2SC2223-F13
Q123	8-729-905-35	2SC4081-R
Q140	8-729-905-12	DTA144EU
Q141	8-729-905-35	2SC4081-R
Q142	8-729-141-48	2SB624-BV345
Q171	8-729-905-35	2SC4081-R
Q172	8-729-905-35	2SC4081-R
Q191	8-729-905-35	2SC4081-R
Q192	8-729-905-18	DTC144EU
Q201	8-729-905-35	2SC4081-R
Q202	8-729-905-12	DTA144EU
Q203	8-729-905-23	2SA1576-R
Q204	8-729-905-35	2SC4081-R
Q205	8-729-100-66	2SC1623
Q206	8-729-905-35	2SC4081-R
Q209	8-729-905-18	DTC144EU
Q210	8-729-905-23	2SA1576-R
Q211	8-729-905-35	2SC4081-R
Q212	8-729-905-35	2SC4081-R
Q213	8-729-904-07	FMG2
Q215	8-729-905-23	2SA1576-R
Q216	8-729-905-18	DTC144EU
Q220	8-729-141-48	2SB624T1-BV345
Q221	8-729-905-18	DTC144EU
Q222	8-729-905-12	DTA144EU
Q223	8-729-905-35	2SC4081-R
Q224	8-729-905-35	2SC4081-R
Q225	8-729-905-12	DTA144EU
Q226	8-729-905-35	2SC4081-R
Q227	8-729-905-35	2SC4081-R
Q228	8-729-905-23	2SA1576-R
Q229	8-729-905-35	2SC4081-R
Q231	8-729-905-35	2SC4081-R
Q232	8-729-905-35	2SC4081-R
Q238	8-729-905-23	2SA1576-R
Q240	8-729-905-35	2SC4081-R
Q241	8-729-905-23	2SA1576-R
Q244	8-729-905-18	DTC144EU
Q245	8-729-905-XX	DTC114TU
Q246	8-729-905-XX	DTC114TU
Q247	8-729-905-XX	DTC114TU
Q248	8-729-905-18	DTC144EU
Q250	8-729-905-35	2SC4081-R
Q301	8-729-905-23	2SA1576-R
Q303	8-729-905-35	2SC4081-R
Q304	8-729-905-35	2SC4081-R
Q306	8-729-905-35	2SC4081-R
Q307	8-729-905-18	DTC144EU
Q310	8-729-905-35	2SC4081-R
Q311	8-729-905-35	2SC4081-R
Q312	8-729-905-12	DTA144EU
Q351	8-729-905-35	2SC4081-R
Q400	8-729-905-18	DTC144EU
Q404	8-729-904-07	FMG2

CC-61 (RELAY), SS-136 (SERVO/SYSTEM CONTROL),FP-89, FP-90 (MECHADECK FLEXIBLE) PRINTED WIRING BOARDS

—Ref. No. CC-61 and SS-136 BOARDS : 3000 series, FP-89 and FP-90 BOARDS : 8000 series—

< DIODE >		
D501	8-719-941-86	DAN202U
D506	8-719-941-86	DAN202U
D510	8-719-404-46	MA110
D901	8-719-938-75	SB05-05CP
D902	8-719-938-75	SB05-05CP
D903	8-719-938-78	SB10-05PCP
< IC >		
IC501	8-752-818-70	CXP80116-826Q
IC502	8-759-148-05	CXA8010M
IC503	8-759-990-55	CXA8006M
IC504	8-759-805-06	CXA1127M
IC506	8-752-035-48	CXA1204Q
IC507	8-759-998-92	LM393D
IC508	8-759-748-65	BR93CS46F
IC901	8-759-500-42	MB3783PFV
< TRANSISTOR >		
Q400	8-729-905-35	2SC4081-R
Q401	8-729-905-35	2SC4081-R
Q402	8-729-905-35	2SC4081-R
Q502	8-729-905-35	2SC4081-R
Q503	8-729-905-24	2SA1576-S
Q505	8-729-905-35	2SC4081-R
Q506	8-729-905-24	2SA1576-S
Q507	8-729-905-35	2SC4081-R
Q508	8-729-905-24	2SA1576-S
Q509	8-729-905-35	2SC4081-R
Q510	8-729-905-35	2SC4081-R
Q511	8-729-905-24	2SA1576-S
Q512	8-729-907-00	DTC114EU
Q513	8-729-905-35	2SC4081-R
Q514	8-729-905-35	2SC4081-R
Q515	8-729-905-18	DTC144EU
Q516	8-729-905-18	DTC144EU
Q540	8-729-822-48	FC101
Q901	8-729-805-25	2SB1121
Q902	8-729-805-25	2SB1121
Q903	8-729-805-25	2SB1121
Q904	8-729-820-47	2SB1202FAT
Q905	8-729-905-35	2SC4081-R

SS-136 BOARD (COMPONENT SIDE)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IC504
IC901
IC503
IC508
CN502
CN503
CN505
Q501
D506
Q515
Q516
Q512
Q513
Q514
Q402
Q905
Q510
Q511
W001
W002
CHASSIS
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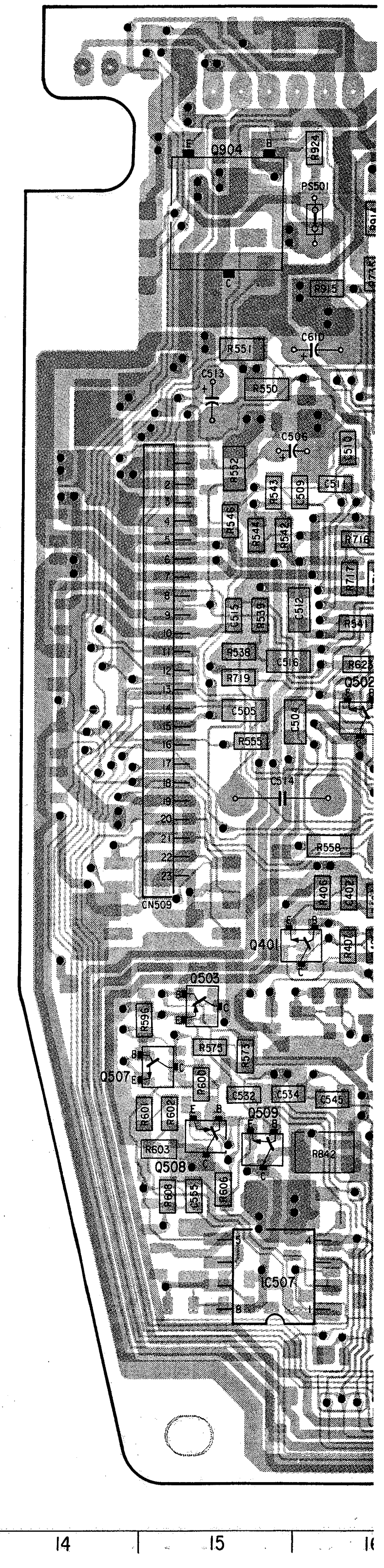
SS-136 BOARD (CONDUCTOR SI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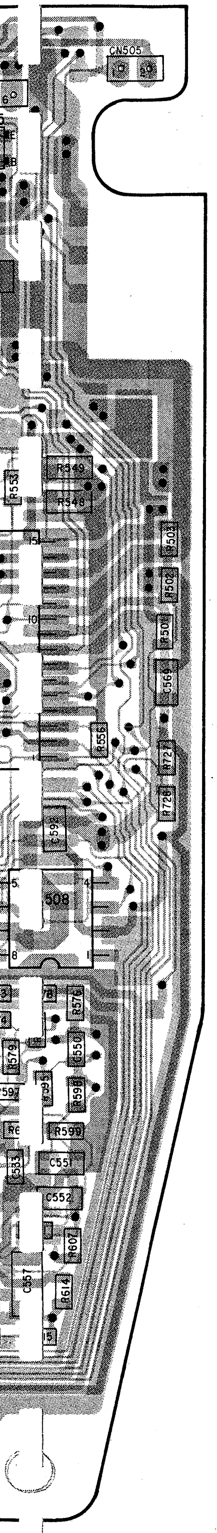
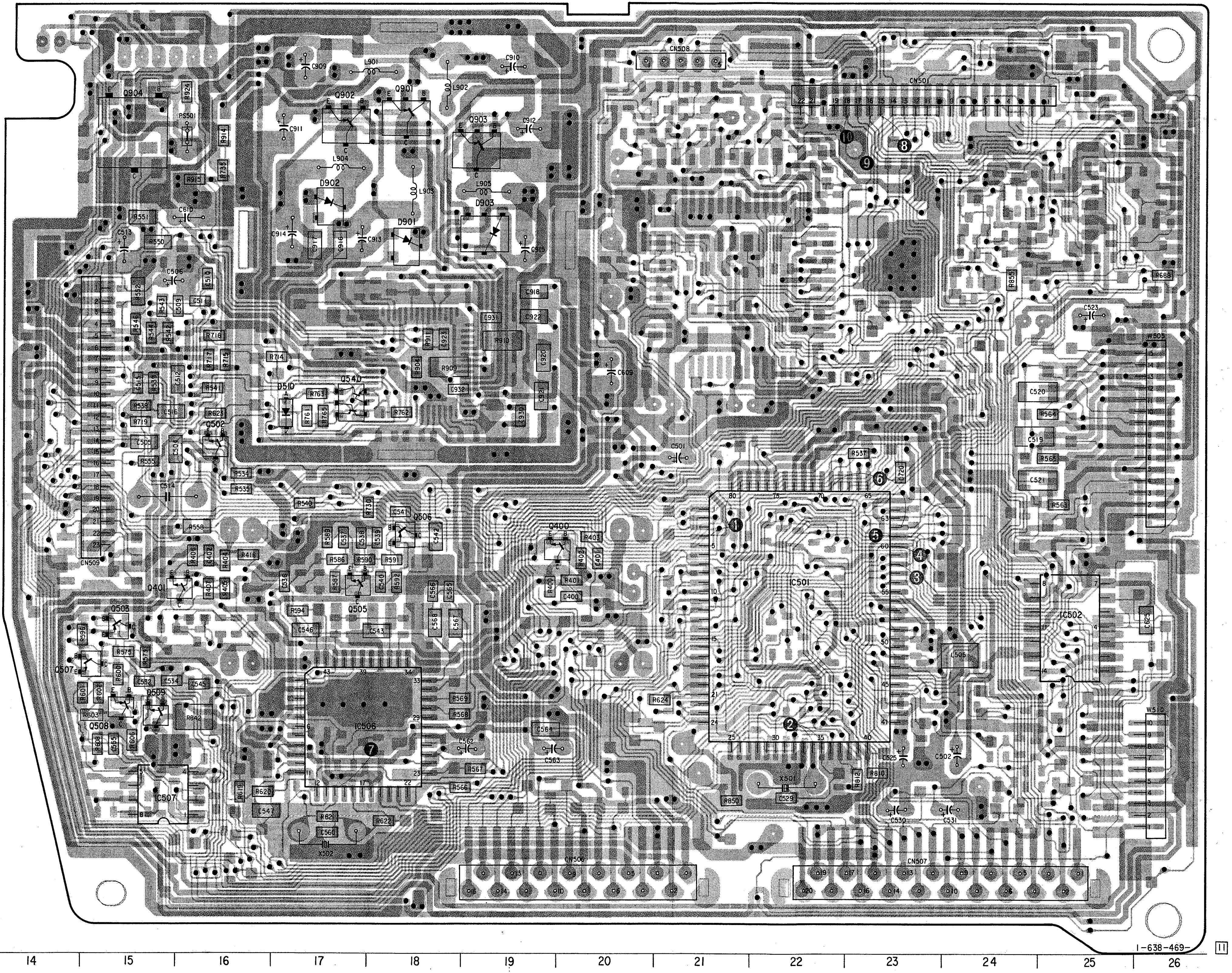
15
16
CN509
IC507
Q904
Q401
Q503
Q507
Q508
Q509


CN505
CN509
IC508
C552
C551

SS-136 BOARD (CONDUCTOR SIDE)


Q904
PS501
Q902
Q901
Q903
L901
L902
L904
L905
D902
D901
D903
C909
C910
C911
C912
C913
C914
C915
C916
C917
CN508
CN501
CN509
D510
Q540
Q502
Q506
Q505
Q400
Q401
Q503
Q507
Q508
Q509
IC501
IC502
IC506
IC507
X501
X502
CN506
CN507
W505
W510
C501
C502
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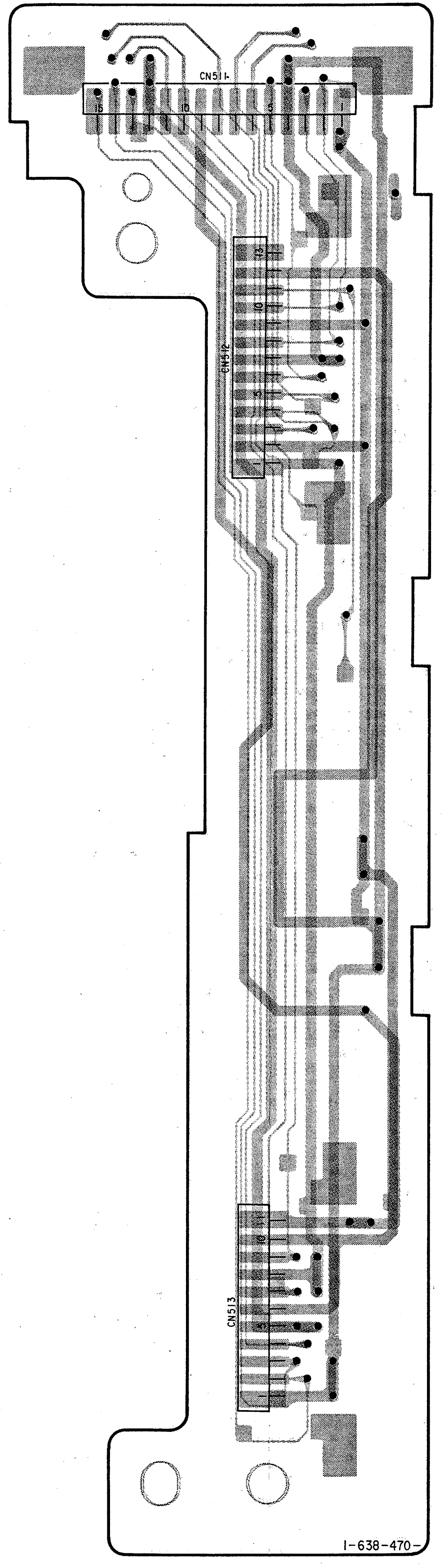
CC-61 BOARD


CN511
CN512
CN513
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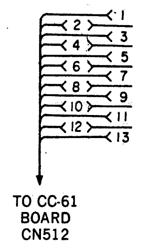
< DIODE
D301

< TRANSI
Q301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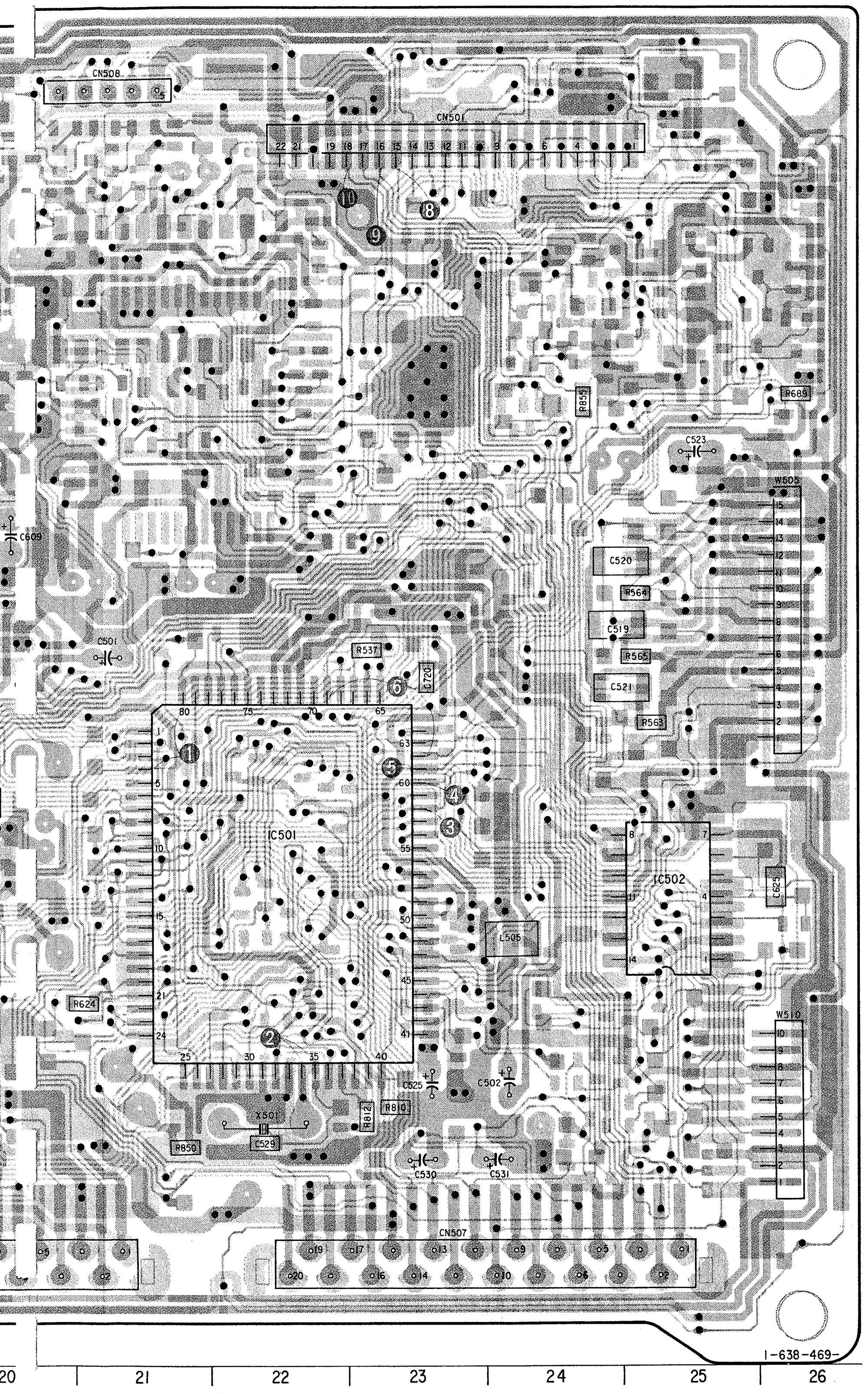
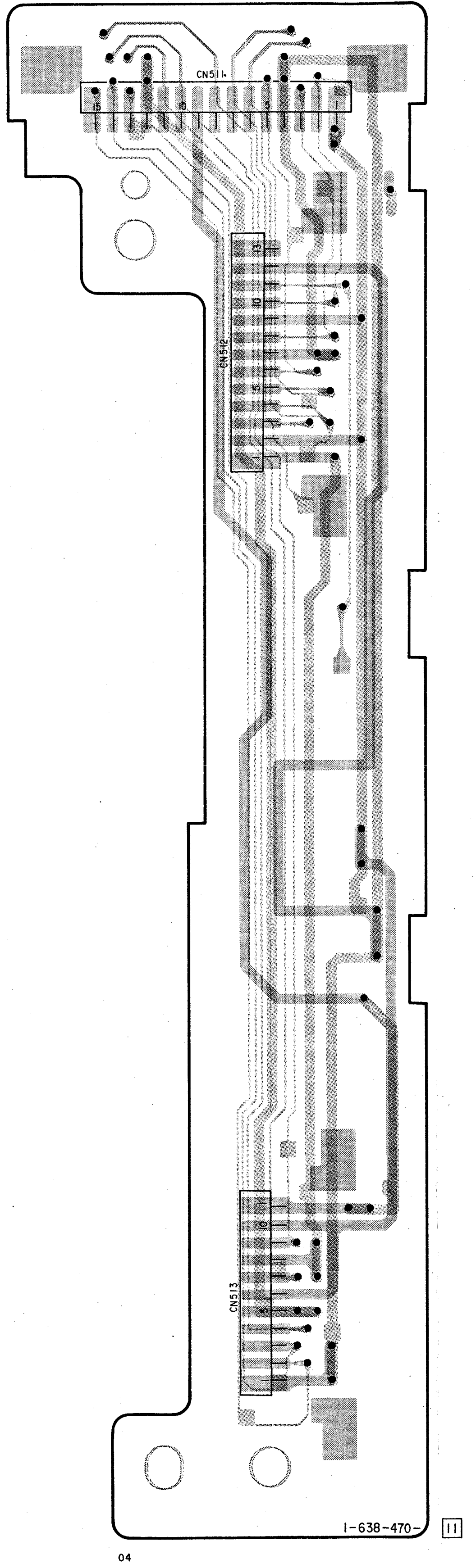
13
TO CC-61
BOARD
CN512

D302
TAPE LED


CN508
CN501
IC501
IC502
CN507
W505
W510
L505
X501
C501
C502
C519
C520
C521
C523
C525
C529
C530
C531
C609
R537
R563
R564
R565
R624
R650
R689
R812
R810
R855
1-638-469-
11
20
21
22
23
24
25
26

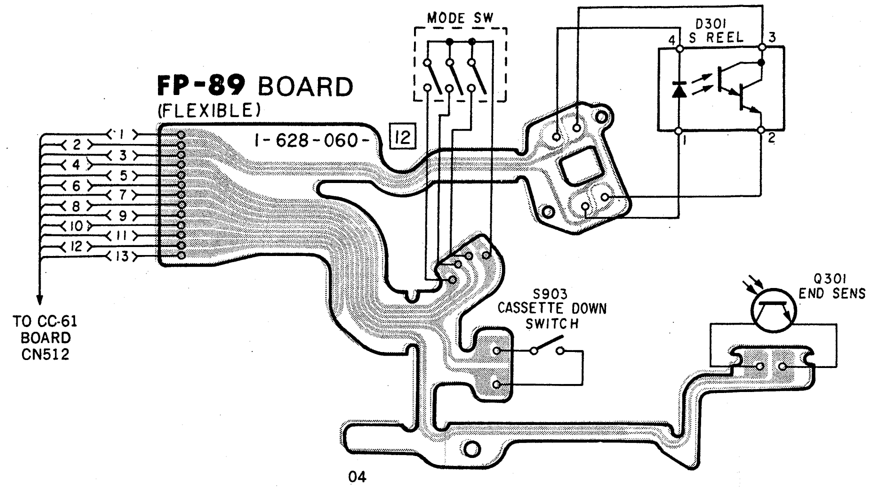
CC-61 BOARD


CN511
CN512
CN513
1-638-470-
11
04

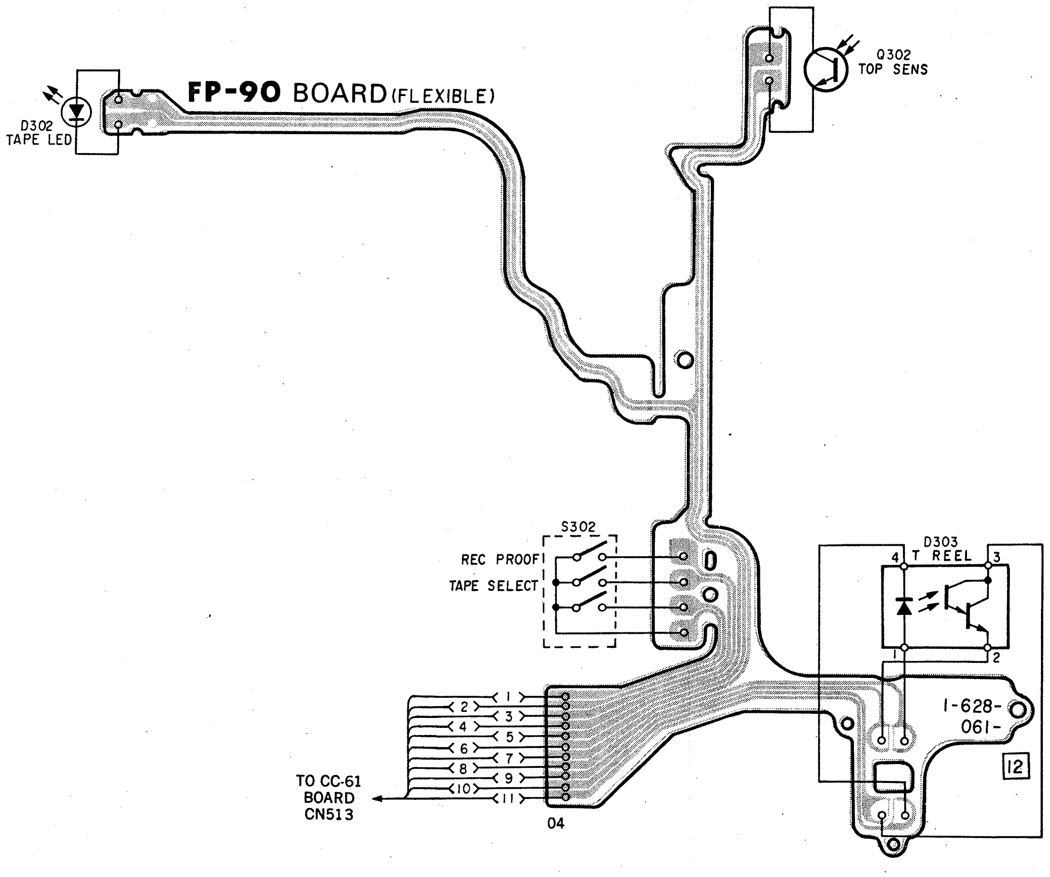
< DIODE >
D301 8-719-820-44 TLP-907-0

< TRANSISTOR >
Q301 8-729-906-48 EE-TP109

FP-89 BOARD
(FLEXIBLE)


MODE SW
D301
S REEL
4
3
1
2
1-628-060-
12
TO CC-61 BOARD CN512
S903
CASSETTE DOWN SWITCH
Q301
END SENS
04

FP-90 BOARD (FLEXIBLE)

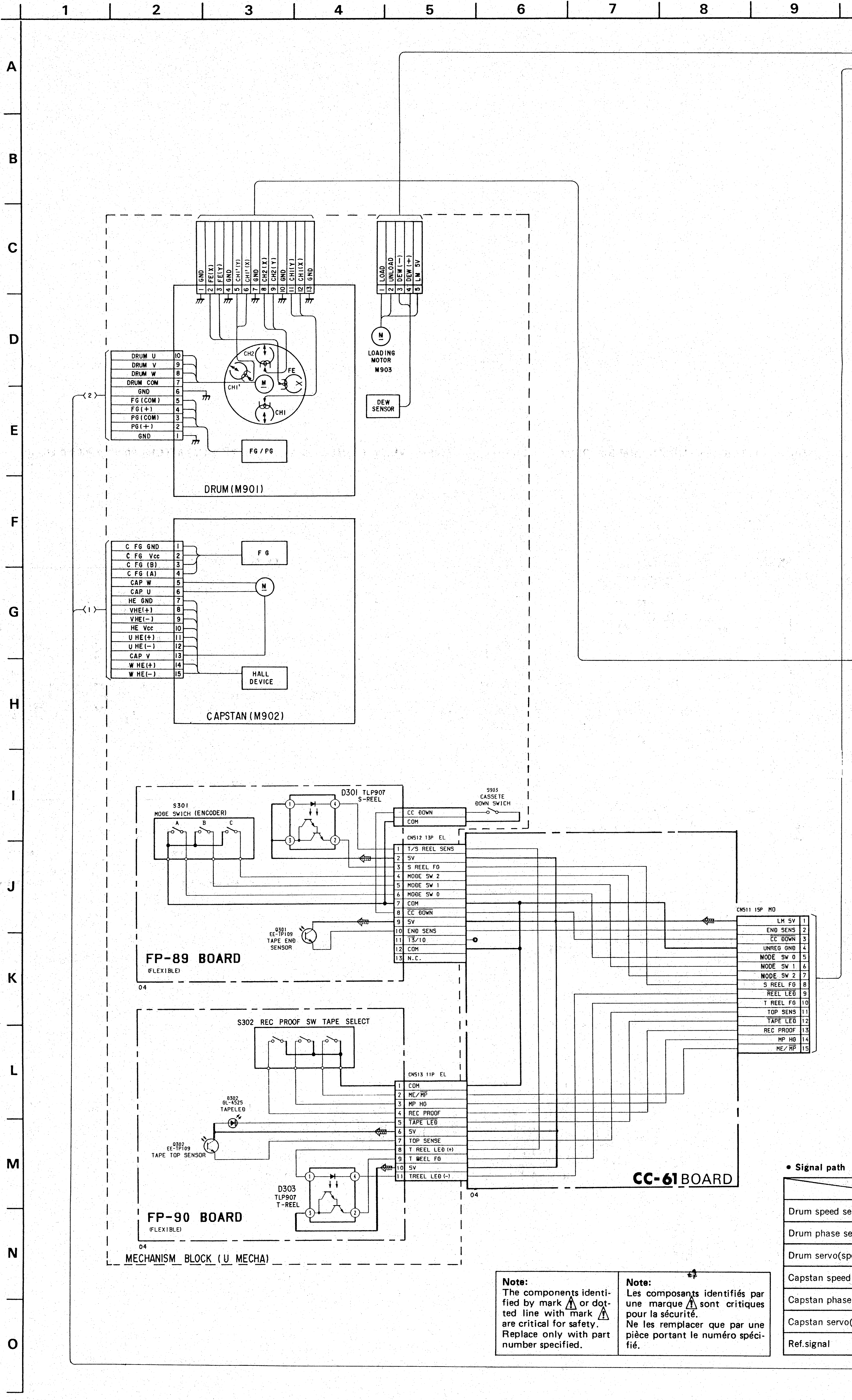

D302
TAPE LED
Q302
TOP SENS
S302
REC PROOF
TAPE SELECT
D303
T REEL
4
3
1
2
1-628-061-
12
TO CC-61 BOARD CN513
04

< DIODE >
D302 8-719-940-81 GL452S
D303 8-719-820-44 TLP-907-0

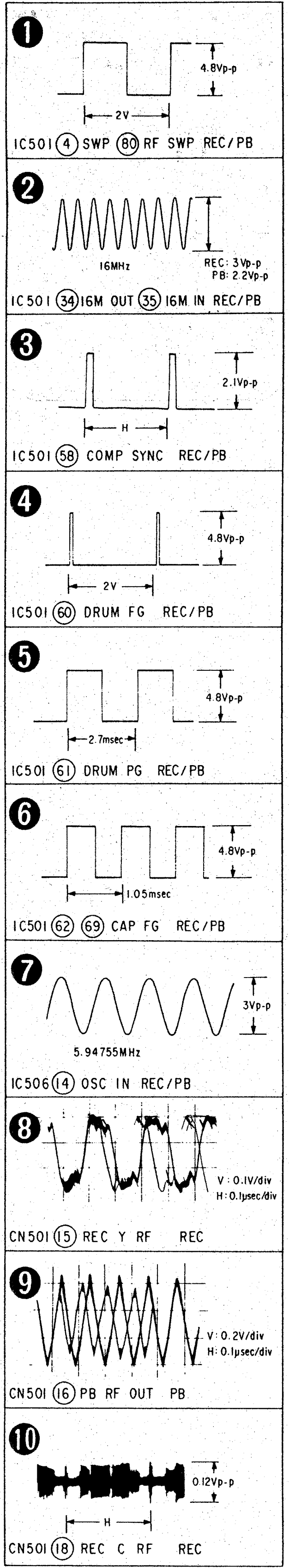
< TRANSISTOR >
Q302 8-729-906-48 EE-TP109

CC-61 (RELAY), SS-136 (SERVO/SYSTEM CONTROL),FP-89, FP-90 (MECHADECK FLEXIBLE) SCHEMATIC DIAGRAM

—Ref. No. CC-61 and SS-136 BOARDS : 3000 series, FP-89 and FP-90 BOARDS : 8000 series—


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
1 GND
2 FE(X)
3 FE(Y)
4 GND
5 CH1'(Y)
6 CH1'(X)
7 GND
8 CH2(X)
9 CH2(Y)
10 GND
11 CH1(Y)
12 CH1(X)
13 GND
1 LOAD
2 UNLOAD
3 DEW(−)
4 DEW(+)
5 LM 5V
LOADING MOTOR M903
DEW SENSOR
CH2
CH1'
CH1
FE
M
DRUM U 10
DRUM V 9
DRUM W 8
DRUM COM 7
GND 6
FG(COM) 5
FG(+) 4
PG(COM) 3
PG(+) 2
GND 1
FG/PG
DRUM (M901)
⟨2⟩
⟨1⟩
C FG GND 1
C FG Vcc 2
C FG (B) 3
C FG (A) 4
CAP W 5
CAP U 6
HE GND 7
VHE(+) 8
VHE(−) 9
HE Vcc 10
U HE(+) 11
U HE(−) 12
CAP V 13
W HE(+) 14
W HE(−) 15
F G
HALL DEVICE
CAPSTAN (M902)
S301 MODE SWICH (ENCODER)
A
B
C
D301 TLP907 S-REEL
S903 CASSETE DOWN SWICH
CC DOWN
COM
CN512 13P EL
1 T/S REEL SENS
2 5V
3 S REEL FG
4 MODE SW 2
5 MODE SW 1
6 MODE SW 0
7 COM
8 CC DOWN
9 5V
10 END SENS
11 13/10
12 COM
13 N.C.
Q301 EE-TP109 TAPE END SENSOR
FP-89 BOARD
(FLEXIBLE)
04
S302 REC PROOF SW TAPE SELECT
CN513 11P EL
1 COM
2 ME/MP
3 MP HG
4 REC PROOF
5 TAPE LED
6 5V
7 TOP SENSE
8 T REEL LED (+)
9 T REEL FG
10 5V
11 TREEL LED (−)
D302 GL-452S TAPELED
Q302 EE-TP109 TAPE TOP SENSOR
D303 TLP907 T-REEL
FP-90 BOARD
(FLEXIBLE)
04
MECHANISM BLOCK (U MECHA)
CN511 15P MO
LM 5V 1
END SENS 2
CC DOWN 3
UNREG GND 4
MODE SW 0 5
MODE SW 1 6
MODE SW 2 7
S REEL FG 8
REEL LED 9
T REEL FG 10
TOP SENS 11
TAPE LED 12
REC PROOF 13
MP HG 14
ME/MP 15
CC-61 BOARD
04

SS-136 BOARD

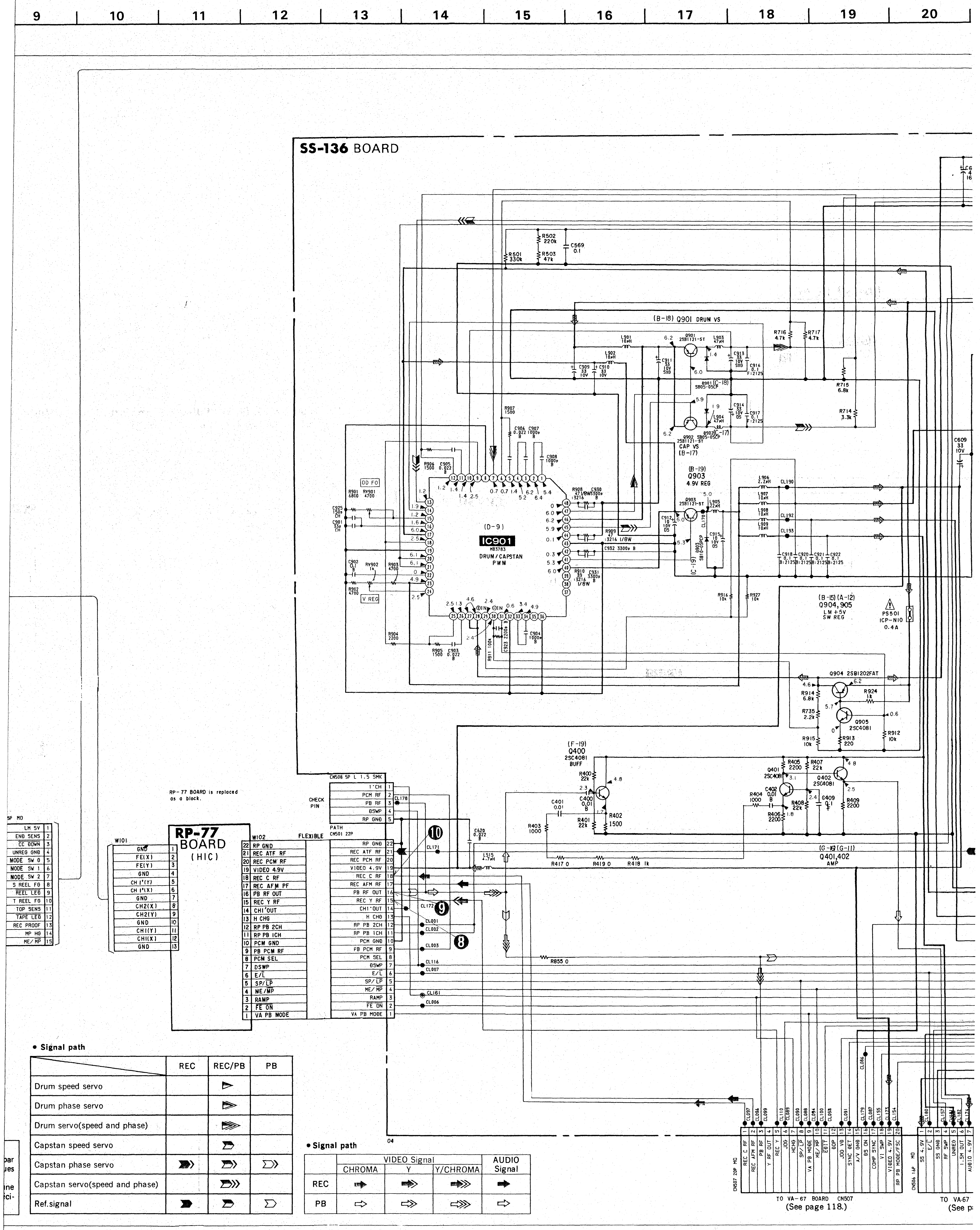


Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

- **Signal path**

Drum speed se
Drum phase se
Drum servo(sp
Capstan speed
Capstan phase
Capstan servo(
Ref.signal

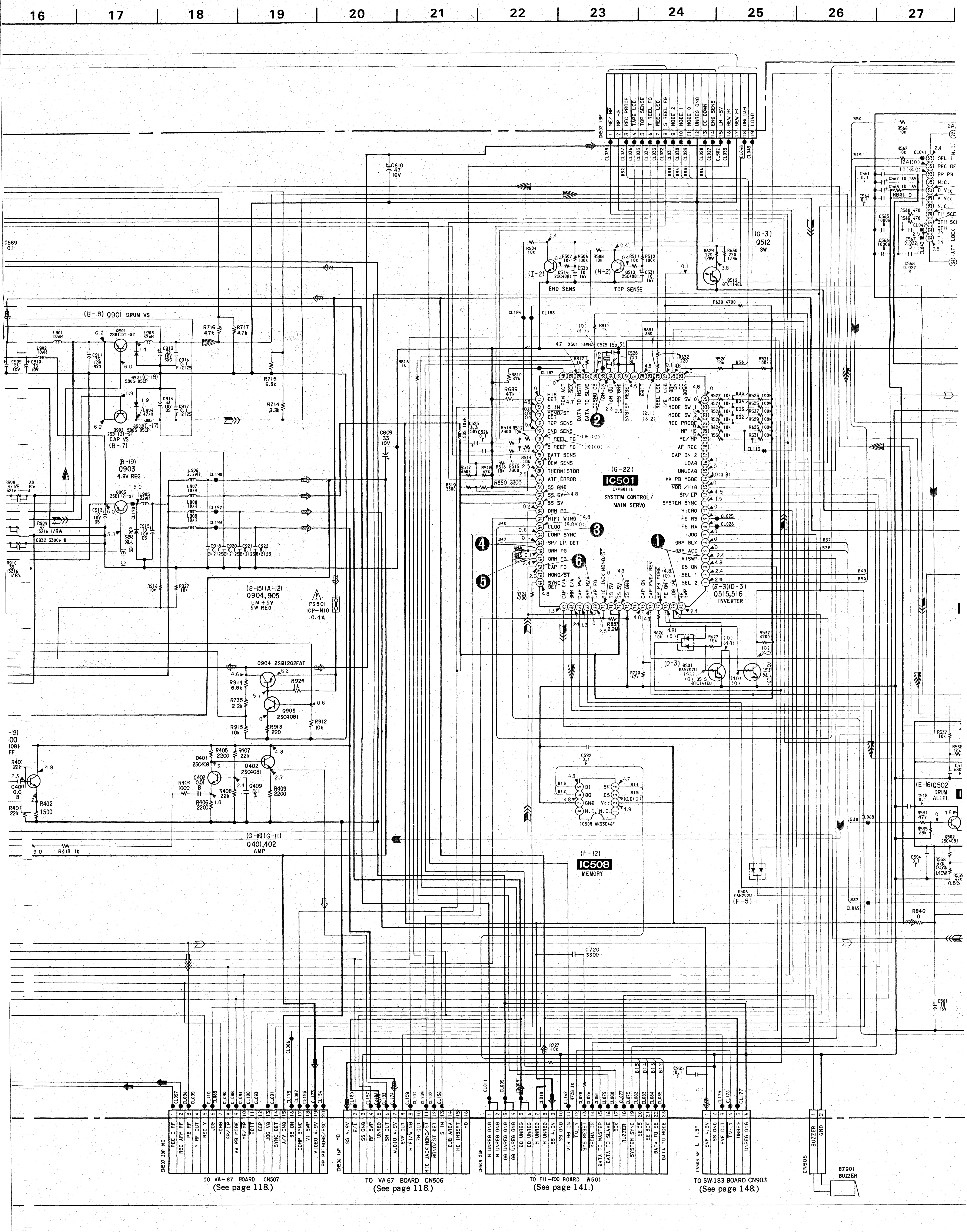

9
10
11
12
13
14
15
16
17
18
19
20
SS-136 BOARD
IC901
MB3783
DRUM/CAPSTAN PWM
(D-9)
(B-18) Q901 DRUM VS
Q901 2SB1121-ST
Q902 2SB1121-ST
CAP VS
(B-17)
(B-19)
Q903
4.9V REG
Q903 2SB1121-ST
(C-19)
D903 SB10-05PCP
D901 SB05-05CP
D902 SB05-05CP
(B-15) (A-12)
Q904,905
LM +5V
SW REG
Q904 2SB1202FAT
Q905 2SC4081
PS501
ICP-N10
0.4A
(F-19)
Q400
2SC4081
BUFF
Q401 2SC4081
Q402 2SC4081
(G-13) (G-11)
Q401,402
AMP
OD FO
V REG
R501 330k
R502 220k
R503 47k
C569 0.1
R716 4.7k
R717 4.7k
R715 6.8k
R714 3.3k
C609 33 10V
R907 1500
C906 0.022 B
C907 1000p B
C908 1000p B
R906 1500
C905 0.022 B
R901 6800
RV901 4700
C925 150p CH
C901 33p CH
C902 0.1 B
RV902 1k
R903 4700
R902 4700
R904 2200
R905 1500
C903 0.022 B
R911 100k
C923 2200p B
C904 1000p B
R908 47 1/8W 3216
C930 3300p B
R909 47 3216 1/8W
C932 3300p B
R910 39 3216 1/8W
C931 3300p B
L901 10μH
L902 10μH
L903 47μH
L904 47μH
C909 33 10V
C910 33 10V
C911 33 10V 5X0
C913 33 10V 5X0
C916 0.1 F:2125
C914 33 10V 0S
C917 0.1 F:2125
C912 10 10V 0S
C915 10 10V 0S
L905 22μH
L906 2.2μH
L907 10μH
L908 10μH
L909 10μH
CL190
CL192
CL193
CL170
C918 0.1 B:2125
C920 0.1 B:2125
C921 0.1 B:2125
C922 0.1 B:2125
R916 10k
R927 10k
R914 6.8k
R924 1k
R735 2.2k
R915 10k
R913 220
R912 10k
R400 22k
C400 0.01 B
C401 0.01
R401 22k
R402 1500
R403 1000
R404 1000
C402 0.01 B
R405 2200
R407 22k
R408 22k
C409 0.1
R406 2200
R409 2200
R417 0
R419 0
R418 1k
R855 0
L515 4.7μH
C620 0.022 B
RP-77 BOARD is replaced as a block.
RP-77
BOARD
(HIC)
W101
W102
FLEXIBLE
CHECK PIN
PATH
CN501 22P
CN508 5P L 1.5 SMK
SP MD
LM 5V 1
END SENS 2
CC DOWN 3
UNREG GND 4
MODE SW 0 5
MODE SW 1 6
MODE SW 2 7
S REEL FG 8
REEL LED 9
T REEL FG 10
TOP SENS 11
TAPE LED 12
REC PROOF 13
MP HG 14
ME/MP 15
GND 1
FE(X) 2
FE(Y) 3
GND 4
CH 1'(Y) 5
CH 1'(X) 6
GND 7
CH2(X) 8
CH2(Y) 9
GND 10
CH1(Y) 11
CH1(X) 12
GND 13
22 RP GND
21 REC ATF RF
20 REC PCM RF
19 VIDEO 4.9V
18 REC C RF
17 REC AFM RF
16 PB RF OUT
15 REC Y RF
14 CH1'OUT
13 H CHG
12 RP PB 2CH
11 RP PB 1CH
10 PCM GND
9 PB PCM RF
8 PCM SEL
7 DSWP
6 E/L
5 SP/LP
4 ME/MP
3 RAMP
2 FE ON
1 VA PB MODE
1'CH 1
PCM RF 2
PB RF 3
DSWP 4
RP GND 5
CL178
CL171
CL172
CL001
CL002
CL003
CL116
CL007
CL161
CL006
⑧
⑨
⑩
04
CN507 20P MD
REC C RF 1
REC AFM RF 2
PB RF 3
Y RF OUT 4
REC Y 5
JOG 6
HCHG 7
SP/LP 8
VA PB MODE 9
ME/MP 10
EDIT 11
BOP 12
JOG VD 13
SYNC DET 14
A/V GND 15
BS ON 16
COMP SYNC 17
V1 SWP 18
VIDEO 4.9V 19
RP PB MODE/FSC 20
CL097
CL096
CL099
CL110
CL089
CL090
CL088
CL094
CL100
CL053
CL091
CL179
CL087
CL155
CL173
CL154
CL086
TO VA-67 BOARD CN507
(See page 118.)
CN506 16P MD
SS 4.9V 1
E/L 2
SS GND 3
RF SWP 4
UNREG 5
1.5M OUT 6
AUDIO 4.9V 7
CL180
CL157
CL181
CL182
CL174
TO VA-67
(See p

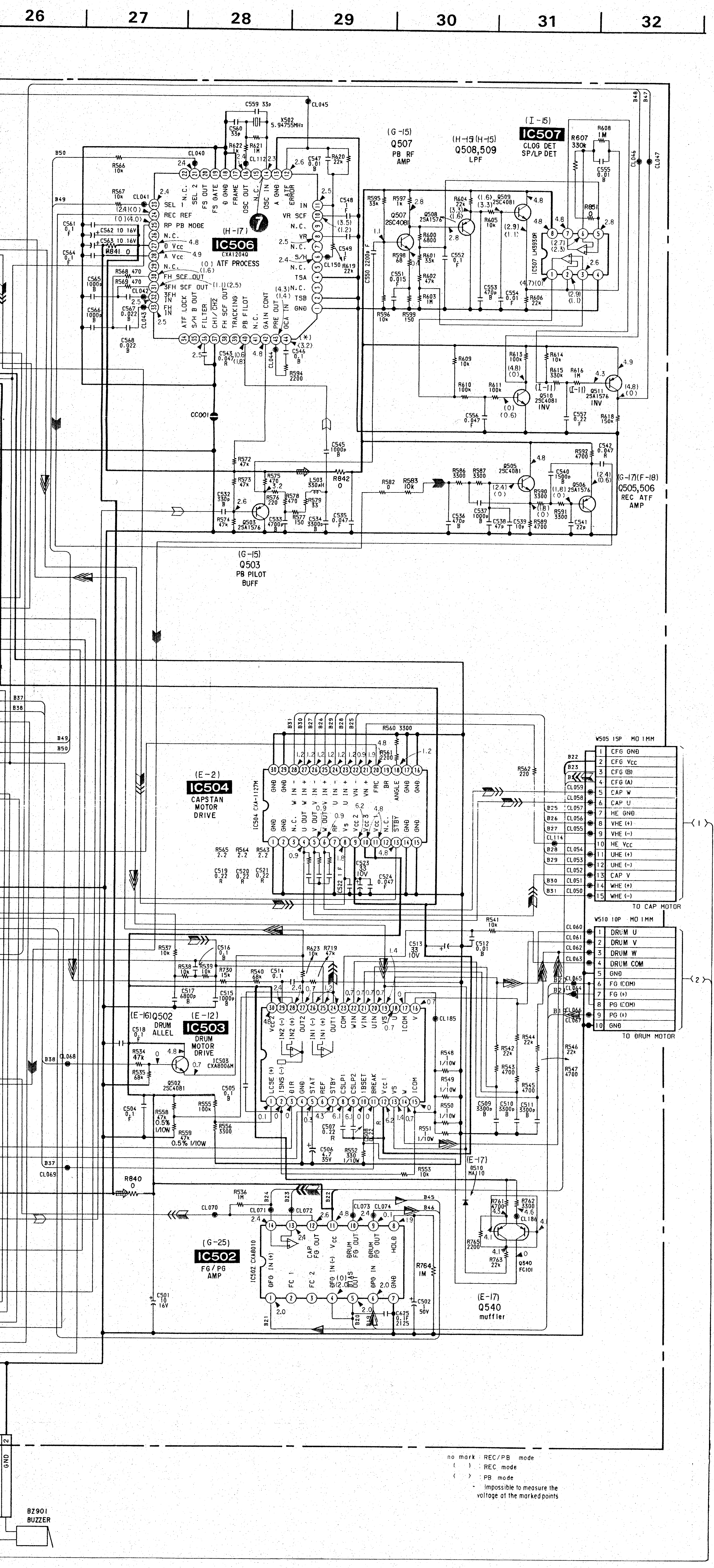
• Signal path

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo(speed and phase)		▷▷▷	
Capstan speed servo		▷	
Capstan phase servo	▶▶	▷▷	▷▷
Capstan servo(speed and phase)		▷▷▷	
Ref.signal	▶	▷	▷

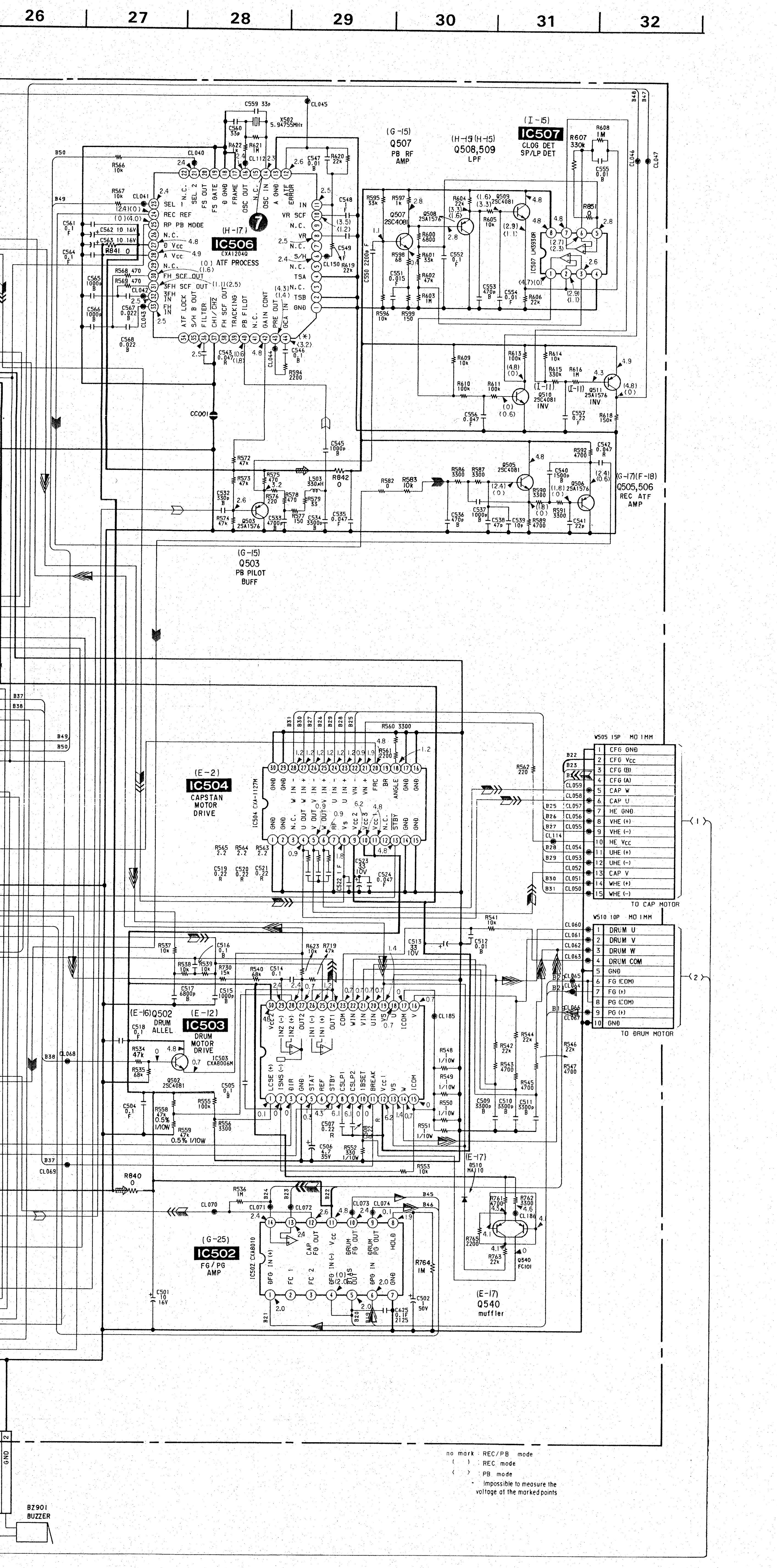
• Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	➡
PB	⇨	⇨⇨	⇨⇨⇨	⇨


16
17
18
19
20
21
22
23
24
25
26
27
(B-18) Q901 DRUM VS
Q901 2SB1121-ST
Q902 2SB1121-ST CAP VS (B-17)
D901 (C-18) SB05-05CP
D902 (C-17) SB05-05CP
(B-19) Q903 4.9V REG
Q903 2SB1121-ST
D903 SB10-05PCP (C-19)
(B-15) (A-12) Q904,905 LM +5V SW REG
PS501 ICP-N10 0.4A
Q904 2SB1202FAT
Q905 2SC4081
Q401 2SC4081
Q402 2SC4081
(G-10) (G-11) Q401,402 AMP
R716 4.7k
R717 4.7k
R715 6.8k
R714 3.3k
C609 33 10V
C610 47 16V
C569 0.1
(I-2) Q514 2SC4081 END SENS
(H-2) Q513 2SC4081 TOP SENSE
(G-3) Q512 SW
Q512 DTC114EU
R628 4700
X501 16MHz
CN502 19P
1 ME/MP
2 MP HG
3 REC PROOF
4 TAPE LED
5 TOP SENSE
6 T REEL FG
7 REEL LED
8 S REEL FG
9 MODE 2
10 MODE 1
11 MODE 0
12 UNREG GND
13 CC DOWN
14 END SENS
15 LM +5V
16 DEW (+)
17 DEW (-)
18 UNLOAD
19 LOAD
(G-22) IC501 CXP80116 SYSTEM CONTROL/ MAIN SERVO
H18 DET
PCM ACT
SCK
DATA TO MSTR
DATA TO SLVE
COSMO CS
T&M IN
T&M OUT
SS GND
SYSTEM RESET
EDIT
REEL LED
T/E MODE SW 0
DRM CC DOWN
MODE SW 0
MODE SW 1
MODE SW 2
REC PROOF
MP HG
ME/MP
AF REC
CAP ON 2
LOAD
UNLOAD
VA PB MODE
NOR /H18
SP/LP
SYSTEM SYNC
H CHG
FE RS
FE RA
JOG
DRM BLK
DRM ACC
V1SWP
DS ON
SEL 1
SEL 2
S IN
MONO/ST DET
TOP SENS
END SENS
T REEL FG
S REEF FG
BATT SENS
DEW SENS
THERMISTOR
ATF ERROR
SS GND
SS 5V
SS 5V
DRM PG
HIFI WIND
CLOG
COMP SYNC
SP/LP DET
DRM PG
DRM FG
CAP FG
MONO/ST
SYNC DET
CAP S/A
DRM B/A
CAP PWM
DRM RVS
CAP FG
MIC JACK MONO/ST
SS 5V
SS 5V
SS GND
CAP ON
CAP FWD/REV
RP PB MODE
FE ON
JOG VD
RF SWP
(E-3) (D-3) Q515,516 INVERTER
(D-3) D501 DAN202U
Q515 DTC144EU
Q516 DTC144EU
D506 DAN202U (F-5)
(F-12) IC508 MEMORY
IC508 AK93C46F
DI
DO
GND
N.C.
SK
CS
Vcc
N.C.
C592 0.1
C720 3300
(E-16) Q502 DRUM ALLEL
Q502 2SC4081
R840 0
C501 10 16V
SEL 1
REC RE
RP PB
N.C.
D Vcc
A Vcc
N.C.
FH SCE
3FH SCI
3FH IN
FH IN
ATF LOCK
CN507 20P MD
1 REC C RF
2 REC AFM RF
3 PB RF
4 Y RF OUT
5 REC Y
6 JOG
7 HCHG
8 SP/LP
9 VA PB MODE
10 ME/MP
11 EDIT
12 DDP
13 JOG VD
14 SYNC DET
15 A/V GND
16 DS ON
17 COMP SYNC
18 V1 SWP
19 VIDEO 4.9V
20 RP PB MODE/FSC
TO VA-67 BOARD CN507 (See page 118.)
CN506 16P MD
1 SS 4.9V
2 E/L
3 SS GND
4 RF SWP
5 UNREG
6 1.5M OUT
7 AUDIO 4.9V
8 EVF OUT
9 HIFI/WIND
10 1.7M OUT
11 MIC JACK MONO/ST
12 MONO/ST DET
13 S IN
14 DUB AREA
15 H8 INSERT
16 H8
TO VA-67 BOARD CN506 (See page 118.)
CN509 23P
1 M UNREG GND
2 M UNREG GND
3 DD UNREG GND
4 DD UNREG GND
5 DD UNREG
6 DD UNREG
7 M UNREG
8 M UNREG
9 SS 4.9V
10 SS GND
11 VTR DD ON
12 TALLY
13 SYS RESET
14 MECHA CS
15 DATA TO MASTER
16 DATA TO SLAVE
17 SCK
18 BUZZER
19 SYSTEM SYNC
20 EE CS
21 EE SCK
22 DATA TO EE
23 DATA TO MODE
TO FU-100 BOARD W501 (See page 141.)
CN503 6P L 1.5P
1 EVF 4.9V
2 SS GND
3 EVF OUT
4 TALLY
5 UNREG
6 UNREG GND
TO SW-183 BOARD CN903 (See page 148.)
CN505
1 BUZZER
2 GND
BZ901 BUZZER


26
27
28
29
30
31
32
(H-17)
IC506
CXA1204Q
ATF PROCESS
(G-15)
Q507
PB RF
AMP
(H-15)(H-15)
Q508,509
LPF
(I-15)
IC507
CLOG DET
SP/LP DET
IC507 LM393DR
(G-17)(F-18)
Q505,506
REC ATF
AMP
(G-15)
Q503
PB PILOT
BUFF
(I-11)
Q510
2SC4081
INV
(I-11)
Q511
2SA1576
INV
X502
5.94755MHz
(E-2)
IC504
CAPSTAN
MOTOR
DRIVE
IC504 CXA-1127M
(E-12)
IC503
DRUM
MOTOR
DRIVE
IC503 CXA8006M
(E-16)Q502
DRUM
ALLEL
(G-25)
IC502
FG/PG
AMP
IC502 CXA8010
(E-17)
Q540
muffler
V505 15P MO 1MM
1 CFG GND
2 CFG Vcc
3 CFG (B)
4 CFG (A)
5 CAP W
6 CAP U
7 HE GND
8 VHE (+)
9 VHE (-)
10 HE Vcc
11 UHE (+)
12 UHE (-)
13 CAP V
14 WHE (+)
15 WHE (-)
TO CAP MOTOR
V510 10P MO 1MM
1 DRUM U
2 DRUM V
3 DRUM W
4 DRUM COM
5 GND
6 FG (COM)
7 FG (+)
8 PG (COM)
9 PG (+)
10 GND
TO DRUM MOTOR
(1)
(2)
GND
BZ901
BUZZER

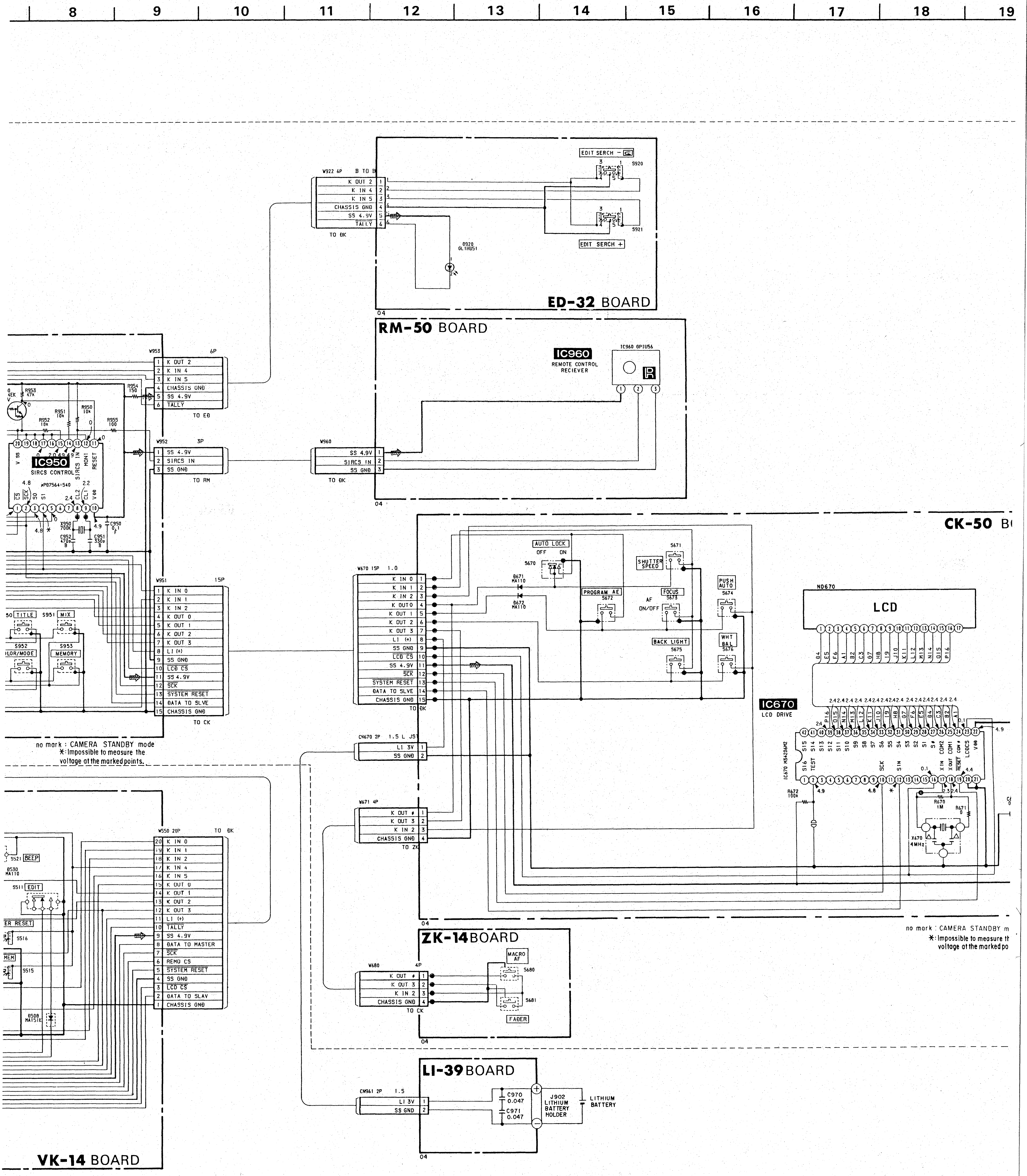
no mark : REC/PB mode
( ) : REC mode
〈 〉 : PB mode
* : Impossible to measure the voltage at the marked points



26
27
28
29
30
31
32
(H-17)
IC506
CXA1204Q
ATF PROCESS
(G-15)
Q507
PB RF
AMP
(H-15)(H-15)
Q508,509
LPF
(I-15)
IC507
CLOG DET
SP/LP DET
(G-15)
Q503
PB PILOT
BUFF
(G-17)(F-18)
Q505,506
REC ATF
AMP
(E-2)
IC504
CAPSTAN
MOTOR
DRIVE
IC504 CXA-1127M
(E-12)
IC503
DRUM
MOTOR
DRIVE
(E-16)Q502
DRUM
ALLEL
(G-25)
IC502
FG/PG
AMP
IC502 CXA8010
(E-17)
Q540
muffler
W505 15P MO 1MM
CFG GND
CFG Vcc
CFG (B)
CFG (A)
CAP W
CAP U
HE GND
VHE (+)
VHE (-)
HE Vcc
UHE (+)
UHE (-)
CAP V
WHE (+)
WHE (-)
TO CAP MOTOR
W510 10P MO 1MM
DRUM U
DRUM V
DRUM W
DRUM COM
GND
FG (COM)
FG (+)
PG (COM)
PG (+)
GND
TO DRUM MOTOR
BZ901
BUZZER
GND
X502
5.9475MHz

no mark : REC/PB mode
( ) : REC mode
⟨ ⟩ : PB mode
* Impossible to measure the voltage at the marked points

?OL RECEIVER), VK-14 (FUNCTION SWITCH), ZK-14 (SWITCH) SCHEMATIC DIAGRAM

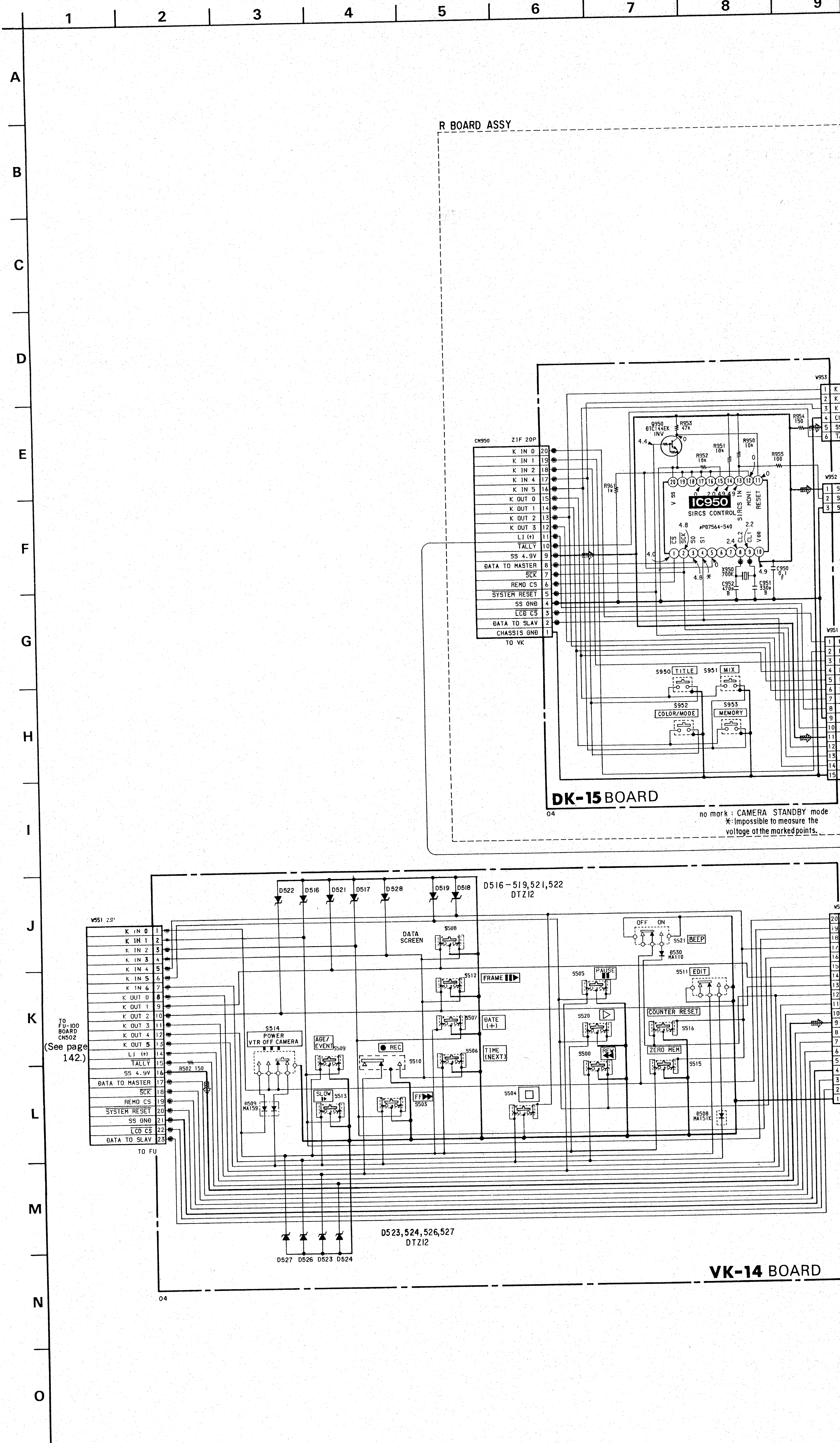

8
9
10
11
12
13
14
15
16
17
18
19
ED-32 BOARD
EDIT SERCH −
S920
EDIT SERCH +
S921
D920 GL1HU51
W922 6P B TO B
K OUT 2
K IN 4
K IN 5
CHASSIS GND
SS 4.9V
TALLY
TO DK
RM-50 BOARD
IC960
REMOTE CONTROL RECIEVER
IC960 GP1U56
W960
SS 4.9V
SIRCS IN
SS GND
TO DK
04
VK-14 BOARD
IC950
SIRCS CONTROL
μPD7564-540
W953 6P
TO ED
W952 3P
TO RM
W951 15P
TO CK
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 3
LI (+)
SS GND
LCD CS
SS 4.9V
SCK
SYSTEM RESET
DATA TO SLVE
CHASSIS GND
TITLE
S951 MIX
S952 COLOR/MODE
S953 MEMORY
X950 700k
R951 10k
R952 10k
R950 10k
R953 47k
R954 150
R955 100
C950 0.1
C951 330p
C952 470p
W550 20P
TO DK
K IN 4
K IN 5
TALLY
DATA TO MASTER
REMO CS
DATA TO SLAV
S521 BEEP
D530 MA110
S511 EDIT
S516
S515
D508 MA151K
CK-50 B
AUTO LOCK
OFF ON
S670
SHUTTER SPEED
S671
PROGRAM AE
S672
AF ON/OFF
FOCUS
S673
PUSH AUTO
S674
BACK LIGHT
S675
WHT BAL
S676
D671 MA110
D672 MA110
W670 15P 1.0
CN670 2P 1.5 L JST
LI 3V
W671 4P
TO ZK
ND670
LCD
IC670
LCD DRIVE
IC670 M34206M2
R672 100k
R670 1M
R671 0
X670 4MHz
ZK-14 BOARD
MACRO AF
S680
S681
FADER
W680 4P
K OUT 3
TO CK
LI-39 BOARD
CN961 2P 1.5
C970 0.047
C971 0.047
J902 LITHIUM BATTERY HOLDER
LITHIUM BATTERY

no mark : CAMERA STANDBY mode
✱: Impossible to measure the voltage at the marked points.

no mark : CAMERA STANDBY m
✱: Impossible to measure t
voltage at the marked po

CK-50, DK-15, ED-32 (FUNCTION SWITCH), LI-39 (LITHIUM BATTERY TERMINAL), RM-50 (REMOTE CONTROL RECEIVER), VK-14 (FUNCT

—Ref. No. CK-50, DK-15, ED-32, LI-39, RM-50, VK-14 and ZK-14 BOARDS : 5000 series—


1
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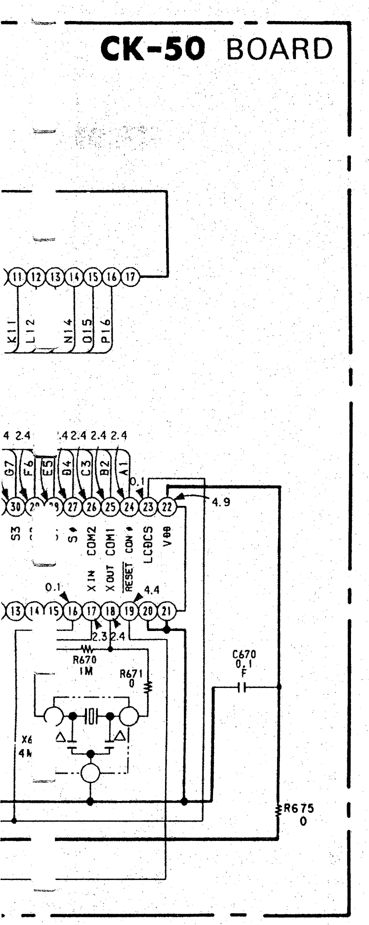
8
9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
R BOARD ASSY
CN950 ZIF 20P
K IN 0
K IN 1
K IN 2
K IN 4
K IN 5
K OUT 0
K OUT 1
K OUT 2
K OUT 3
LI (+)
TALLY
SS 4.9V
DATA TO MASTER
SCK
REMO CS
SYSTEM RESET
SS GND
LCD CS
DATA TO SLAV
CHASSIS GND
TO VK
IC950
SIRCS CONTROL
μPD7564-540
Q950 DTC144EK INV
R953 47k
R952 10k
R951 10k
R950 10k
R955 100
R954 150
R961 1k
X950 700K
C952 470p B
C951 330p B
C950 0.1 F
V SS
SIRCS IN
MONI
RESET
CS
SCK
SO
SI
CL2
CL1
V DD
4.4
4.8
4.0
2.4
2.2
4.9
2.0
S950 TITLE
S951 MIX
S952 COLOR/MODE
S953 MEMORY
DK-15 BOARD
no mark : CAMERA STANDBY mode
✱ : Impossible to measure the voltage at the marked points.
04
V951
V952
V953
D522
D516
D521
D517
D528
D519
D518
D516-519,521,522 DTZ12
V551 23P
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
LI (+)
TALLY
SS 4.9V
DATA TO MASTER
SCK
REMO CS
SYSTEM RESET
SS GND
LCD CS
DATA TO SLAV
TO FU
TO FU-100 BOARD CN502 (See page 142.)
R502 150
DATA SCREEN
S508
S512
FRAME
S507
DATE (+)
S506
TIME (NEXT)
S514 POWER VTR OFF CAMERA
AGE/EVENT
S509
● REC
S510
FF
S503
SLOW
S513
D509 MA159
S504
S505
PAUSE
S520
S500
REW
OFF ON
S521 BEEP
D530 MA110
S511 EDIT
COUNTER RESET
S516
ZERO MEM
S515
D508 MA151K
D523,524,526,527 DTZ12
D527 D526 D523 D524
VK-14 BOARD
04


CK-50 BOARD
K11
L12
N14
O15
P16
G7
F6
E5
D4
C3
B2
A1
4.9
S3
S#
X IN
X OUT
COM2
COM1
RESET
CON #
LCDCS
V00
0.1
4.4
2.3
2.4
R670 1M
R671 0
C670 0.1 F
X6 4M
R675 0

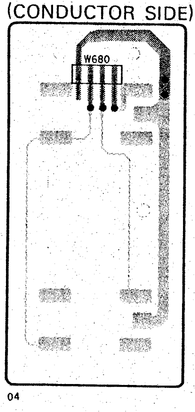
no ···k : CAMERA STANDBY mode
*: Impossible to measure the voltage at the marked points.

< DIODE >		
D671	8-719-404-46	MA110
D672	8-719-404-46	MA110
D920	8-719-941-34	GL1HD51
< IC >		
IC670	8-759-634-72	M34206M2-109FP
IC950	8-759-145-63	uPD7564G-540
IC960	8-749-921-76	GP1U56
< TRANSISTOR >		
Q950	8-729-901-01	DTC144EK

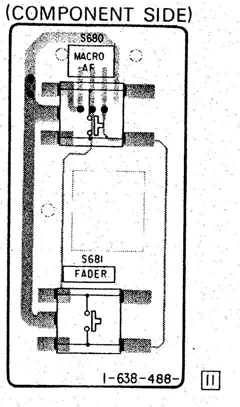
CK-50, DK-15, ED-32 (FUNCTION SWITCH), LI-39 (LITHIUM BATTERY TERMINAL), RM-50 (REMOTE CONTROL RECEIVER), VK-14 (FUNCTION SW

—Ref. No. CK-50, DK-15, ED-32, LI-39, RM-50, VK-14 and ZK-14 BOARDS : 5000 series—

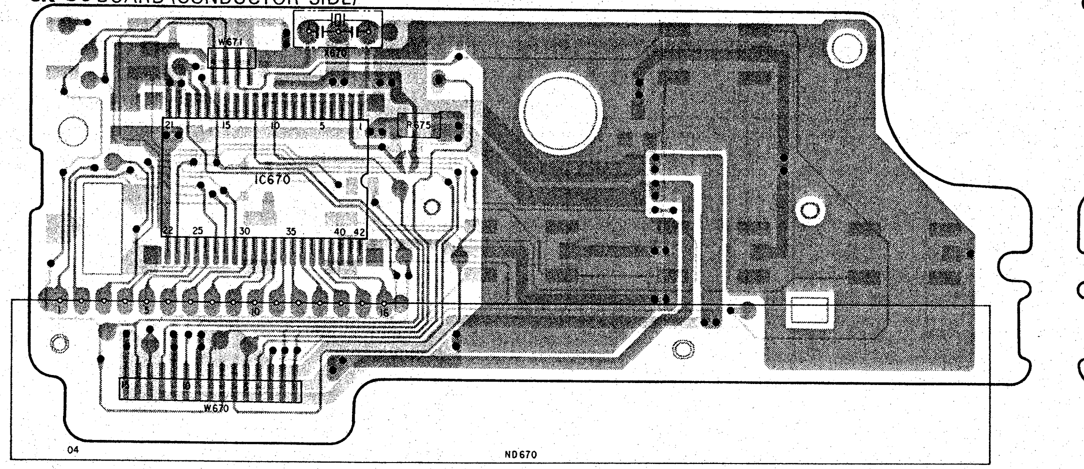
ZK-14 BOARD (CONDUCTOR SIDE)



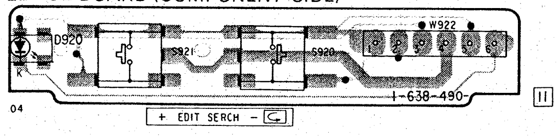
ZK-14 BOARD (COMPONENT SIDE)


S680
MACRO AF
S681
FADER
1-638-488-
II

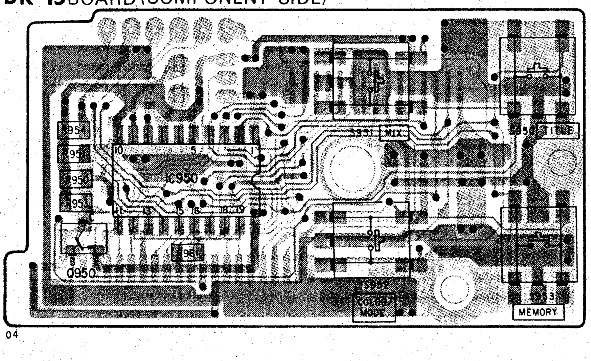
CK-50 BOARD (CONDUCTOR SIDE)


W671
IC670
R675
W670
04
ND670

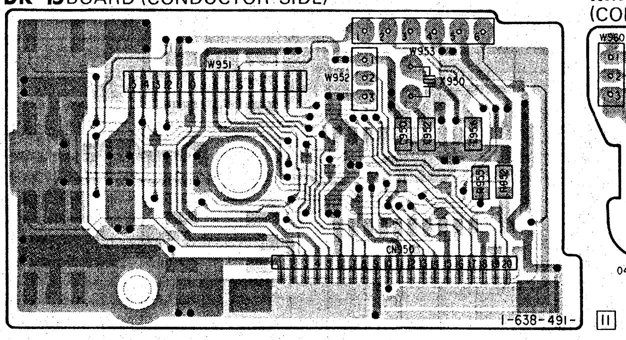
ED-32 BOARD (COMPONENT SIDE)


D920
S921
S920
W922
1-638-490-
II
04
+ EDIT SERCH -

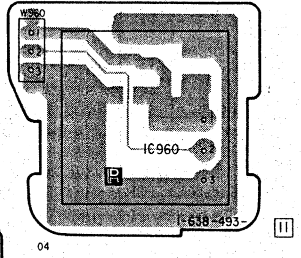
DK-15 BOARD (COMPONENT SIDE)


IC950
Q950
S951
MIX
TITLE
MODE
MEMORY
04

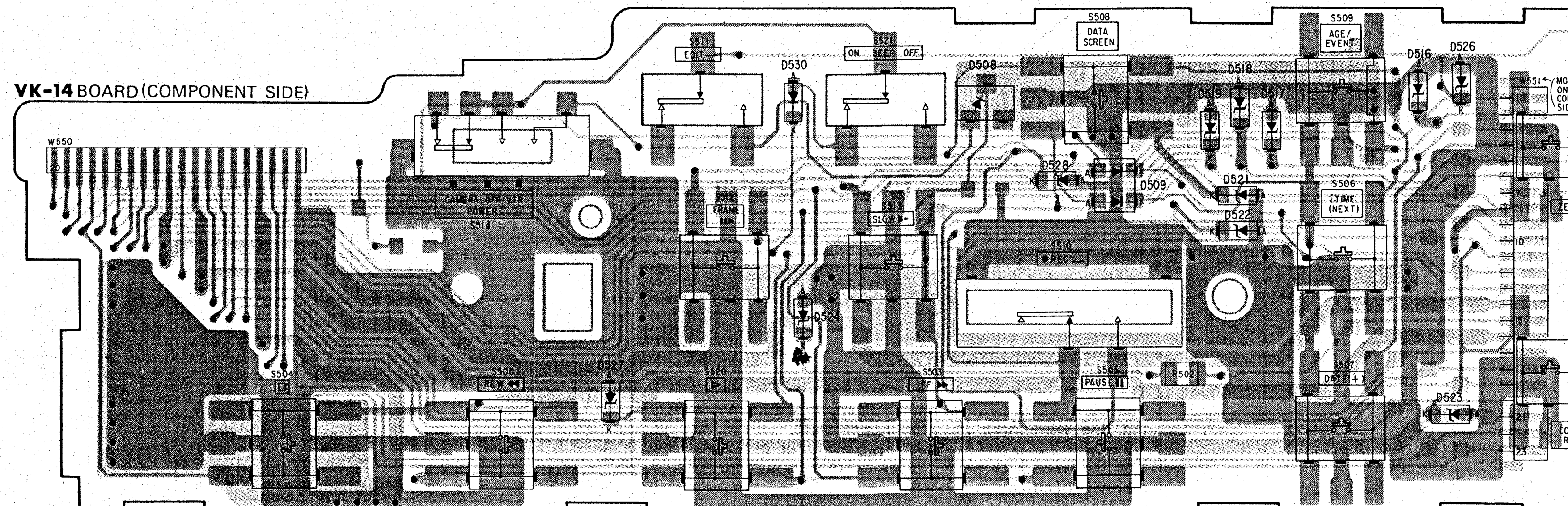
DK-15 BOARD (CONDUCTOR SIDE)


W951
W952
W953
CN950
1-638-491-
II

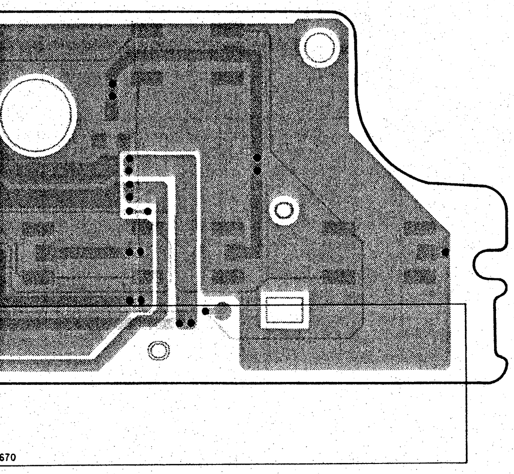
RM-50 BOARD (CONDUCTOR SIDE)


W960
IC960
1-638-493-
II
04

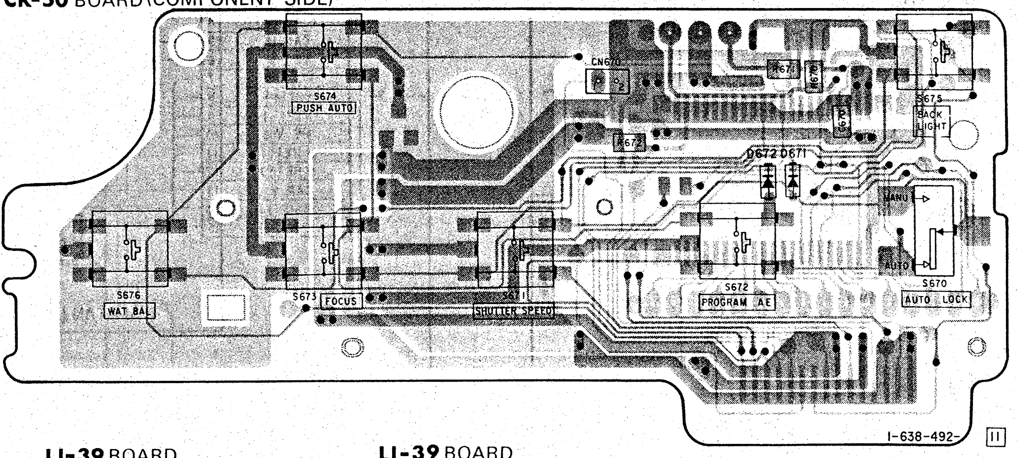
VK-14 BOARD (COMPONENT SIDE)


W550
S514
CAMERA STANDBY POWER
S511
EDIT
S521
ON BEEP OFF
D530
D508
S506
DATA SCREEN
S509
AGE/ EVENT
D516
D526
D518
D519
D517
D528
D509
D521
D522
S505
TIME (NEXT)
S513
SLOW
S512
FRAME
S510
REC
D524
D527
S504
S503
REW
S502
PAUSE
S501
S507
DATE
D523
04
1-638-

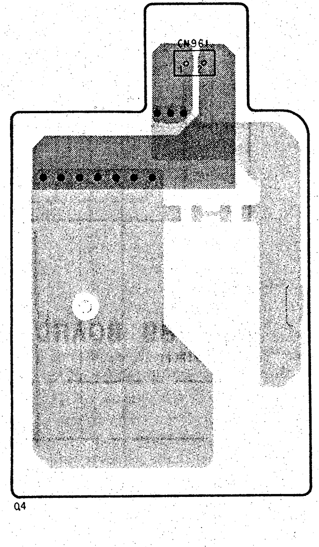
E CONTROL RECEIVER), VK-14 (FUNCTION SWITCH), ZK-14 (SWITCH) PRINTED WIRING BOARDS



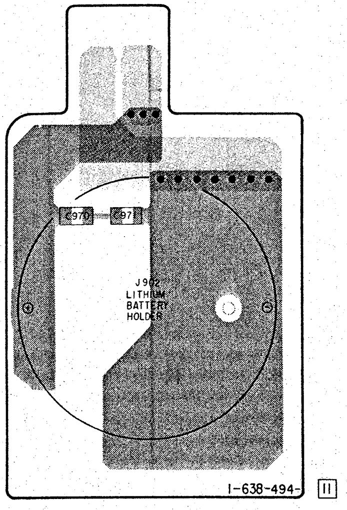
CK-50 BOARD (COMPONENT SIDE)


S674
PUSH AUTO
CN670
S675
BACK LIGHT
D672 D671
MANU
AUTO
S676
WHT BAL
S673
FOCUS
S671
SHUTTER SPEED
S672
PROGRAM AE
S670
AUTO LOCK
1-638-492

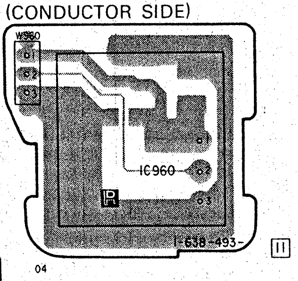
LI-39 BOARD
(CONDUCTOR SIDE)

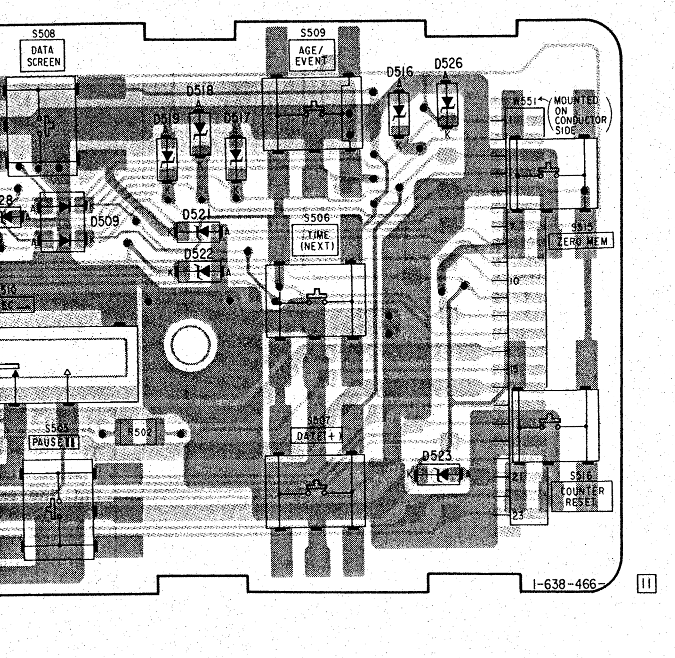


LI-39 BOARD
(COMPONENT SIDE)


J970
J971
J970
LITHIUM
BATTERY
HOLDER
1-638-494

RM-50 BOARD
(CONDUCTOR SIDE)


W960
IC960
1-638-493

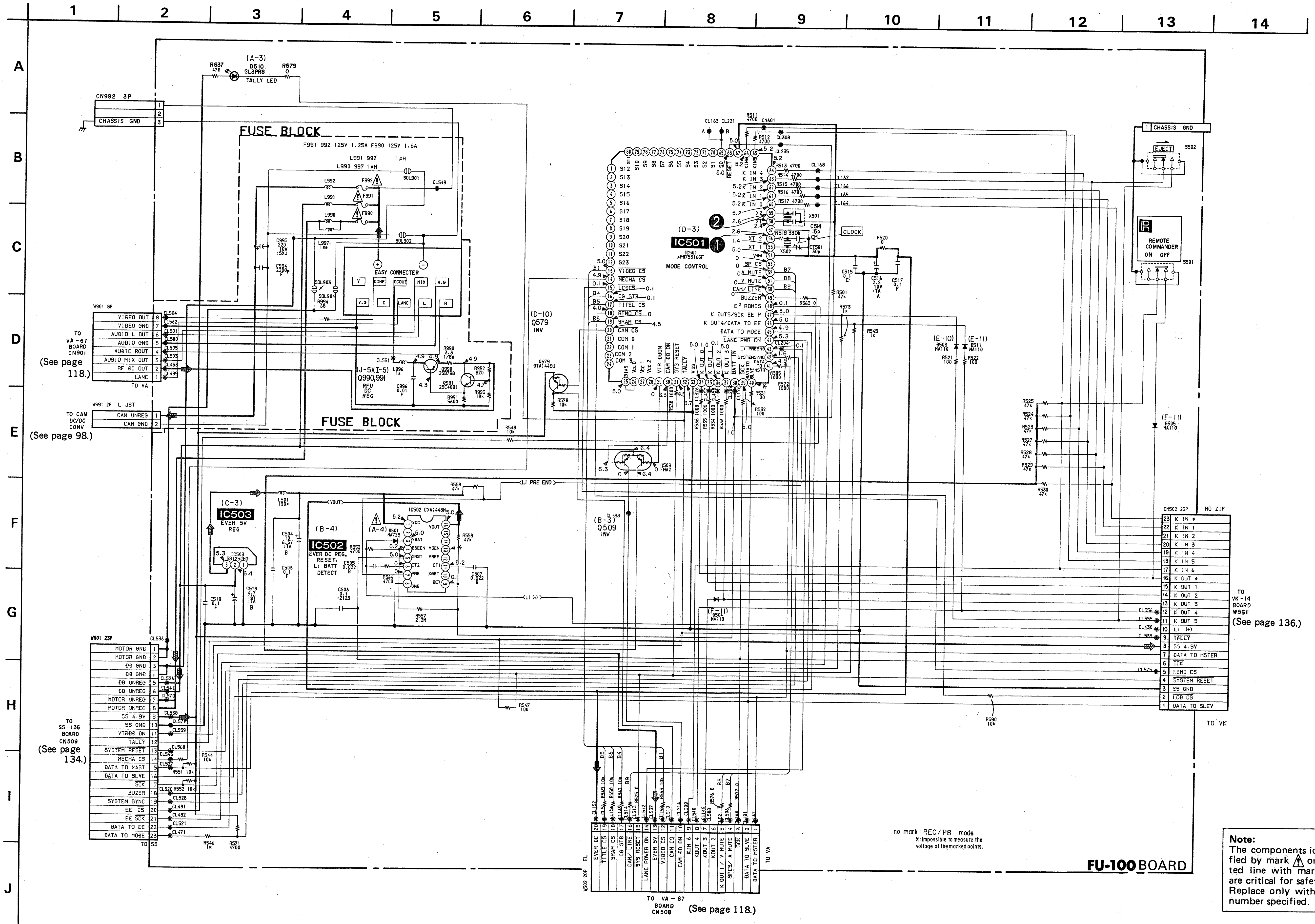

S508
DATA SCREEN
S509
AGE/EVENT
D516
D526
D518
D519
D517
W551
MOUNTED ON CONDUCTOR SIDE
D509
D521
D522
S506
TIME (NEXT)
S515
ZERO MEM
S503
PAUSE
S507
DATE(+)
D523
S516
COUNTER RESET
1-638-466

< DIODE >

D508	8-719-420-33	MA151K
D509	8-719-940-45	DWA010
D516	8-719-977-34	DTZ12
D517	8-719-977-34	DTZ12
D518	8-719-977-34	DTZ12
D519	8-719-977-34	DTZ12
D521	8-719-977-34	DTZ12
D522	8-719-977-34	DTZ12
D523	8-719-977-34	DTZ12
D524	8-719-977-34	DTZ12
D526	8-719-977-34	DTZ12
D527	8-719-977-34	DTZ12
D528	8-719-977-34	DTZ12
D530	8-719-404-46	MA110

FU-100 (MODE CONTROL, MAIN BATTERY TERMINAL) SCHEMATIC DIAGRAM

—Ref. No. FU-100 BOARD: 5000 series—


1
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5
6
7
8
9
10
11
12
13
14
A
B
C
D
E
F
G
H
I
J
(A-3)
D510
GL3PR8
TALLY LED
R537 470
R579 0
CN992 3P
CHASSIS GND
FUSE BLOCK
F991 992 125V 1.25A F990 125V 1.6A
L991 992 1μH
L990 997 1μH
SOL901
SOL902
SOL903
SOL904
EASY CONNECTER
Y
COMP
RCOUT
MIX
A.0
V.0
LANC
L
R
(J-5)(I-5)
Q990,991
RFU
DC
REG
W901 8P
VIDEO OUT
VIDEO GND
AUDIO L OUT
AUDIO GND
AUDIO ROUT
AUDIO MIX OUT
RF DC OUT
LANC
TO VA
TO
VA-67
BOARD
CN901
(See page 118.)
W991 2P L JST
TO CAM
DC/DC
CONV
CAM UNREG
CAM GND
(See page 98.)
FUSE BLOCK
(D-10)
Q579
INV
(D-3)
IC501
MODE CONTROL
CLOCK
R520
(E-10)
(E-11)
(F-11)
CHASSIS GND
EJECT
S502
REMOTE
COMMANDER
ON OFF
S501
(C-3)
IC503
EVER 5V
REG
(B-4)
IC502
EVER DC REG,
RESET,
Li BATT
DETECT
(A-4)
IC502 CXA1448N
(B-3)
Q509
INV
Li PRE END
Li (+)
W501 23P
MOTOR GND
MOTOR GND
DD GND
DD GND
DD UNREG
DD UNREG
MOTOR UNREG
MOTOR UNREG
SS 4.9V
SS GND
VTRDD ON
TALLY
SYSTEM RESET
MECHA CS
DATA TO MAST
DATA TO SLVE
SCK
BUZER
SYSTEM SYNC
EE CS
EE SCK
DATA TO EE
DATA TO MODE
TO SS
TO
SS-136
BOARD
CN509
(See page 134.)
CN502 23P
MD ZIF
K IN 0
K IN 1
K IN 2
K IN 3
K IN 4
K IN 5
K IN 6
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K OUT 4
K OUT 5
Li (+)
TALLY
SS 4.9V
DATA TO MSTER
SCK
REMO CS
SYSTEM RESET
SS GND
LCD CS
DATA TO SLEV
TO
VK-14
BOARD
W551
(See page 136.)
TO VK
W502 20P
EVER DC
TITLE CS
SRAM CS
CG STB
CAM/LINE
SYS RESET
LANC POWER ON
EVER 5V
VIDEO CS
CAM DD ON
KIN 6
KOUT 4
KOUT 3
K OUT 1 / V MUTE
SPCS/A MUTE
SCK
DATA TO SLVE
DATA TO MSTER
TO VA
TO VA-67
BOARD
CN508
(See page 118.)
no mark : REC/PB mode
※ : Impossible to measure the voltage at the marked points.
FU-100 BOARD

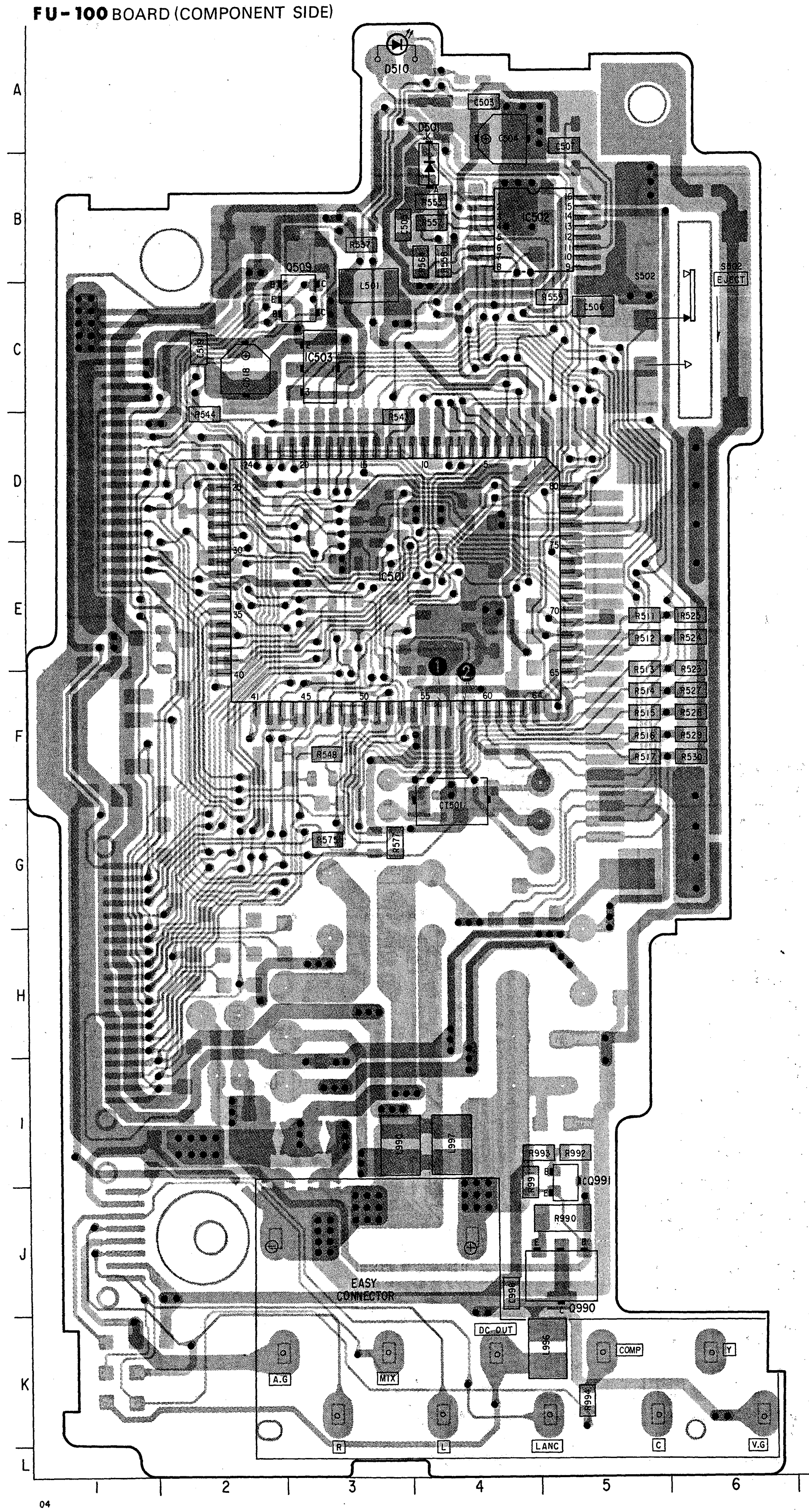
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifi une marque ⚠ sont cri pour la sécurité.
Ne les remplacer que p pièce portant le numéro fié.

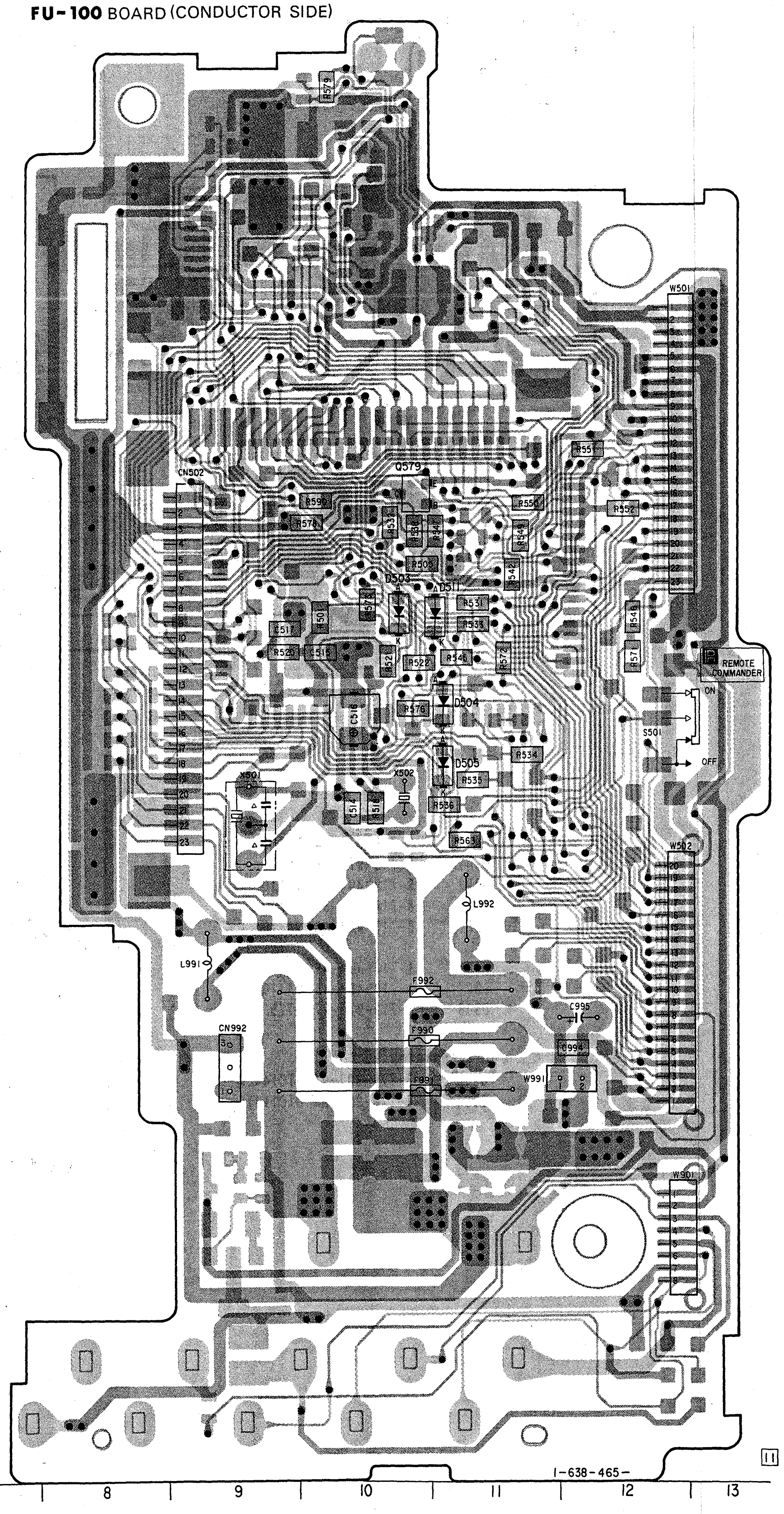
FU-100 (MODE CONTROL, MAIN BATTERY TERMINAL) PRINTED WIRING BOARD

—Ref. No. FU-100 BOARD : 5000 series—

FU-100 BOARD (COMPONENT SIDE)

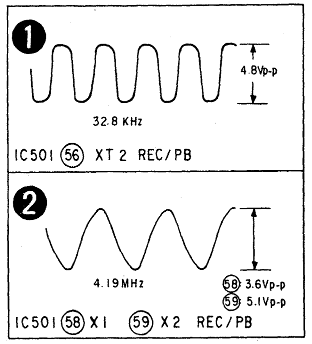

A
B
C
D
E
F
G
H
I
J
K
L
D510
D501
IC502
IC501
IC503
Q509
L561
S502
EJECT
CT501
Q991
Q990
R993
R992
R990
EASY
CONNECTOR
DC-OUT
A.G
MIX
COMP
Y
R
L
LANC
C
V.G
1
2
3
4
5
6
04

FU-100 BOARD (CONDUCTOR SIDE)


CN502
Q579
D503
D511
D504
D505
X501
X502
REMOTE
COMMANDER
S501
ON
OFF
W501
W502
W901
W991
L991
L992
F992
F990
F991
CN992
C995
C994
1-638-465-
11
7
8
9
10
11
12
13

< DIODE >		
D501	• 8-719-421-27	MA728
D503	8-719-404-46	MA110
D504	8-719-404-46	MA110
D505	8-719-404-46	MA110
D510	8-719-812-41	TLR124, RED
D511	8-719-404-46	MA110
< IC >		
IC501	8-759-154-18	uPD75316GF-116-3B9
IC502	8-759-511-22	CXA1448N
IC503	8-759-937-54	S-81250HG-RD-S
< TRANSISTOR >		
Q509	8-729-904-20	FMA2
Q579	8-729-905-12	DTA144EU
Q990	8-729-101-07	2SB798-DL
Q991	8-729-905-35	2SC4081-R

FU - 100 BOARD


❶
4.8Vp-p
32.8 KHz
IC501 ㊻ XT 2 REC/PB
❷
4.19MHz
㊿ 3.6Vp-p
(59) 5.1Vp-p
IC501 ㊿ X1 (59) X2 REC/PB

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

MC-76 (MIC), SW-183 (SWITCH, JACK) PRINTED WIRING BOARDS

—Ref. No. MC-76 and SW-183 BOARDS: 4000 series—

< DIODE >

D652	8-719-106-43	RD9. 1M-B1
D655	8-719-404-46	MA110

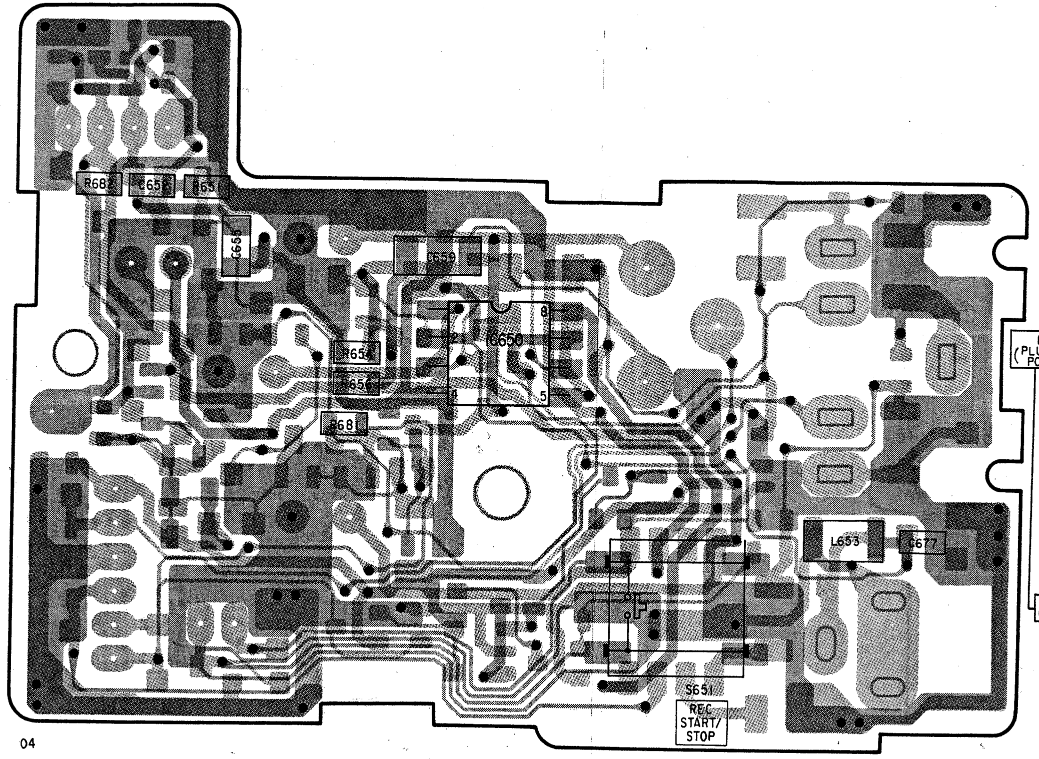
< IC >

IC650	8-759-822-37	LA7293M-TE-L

< TRANSISTOR >

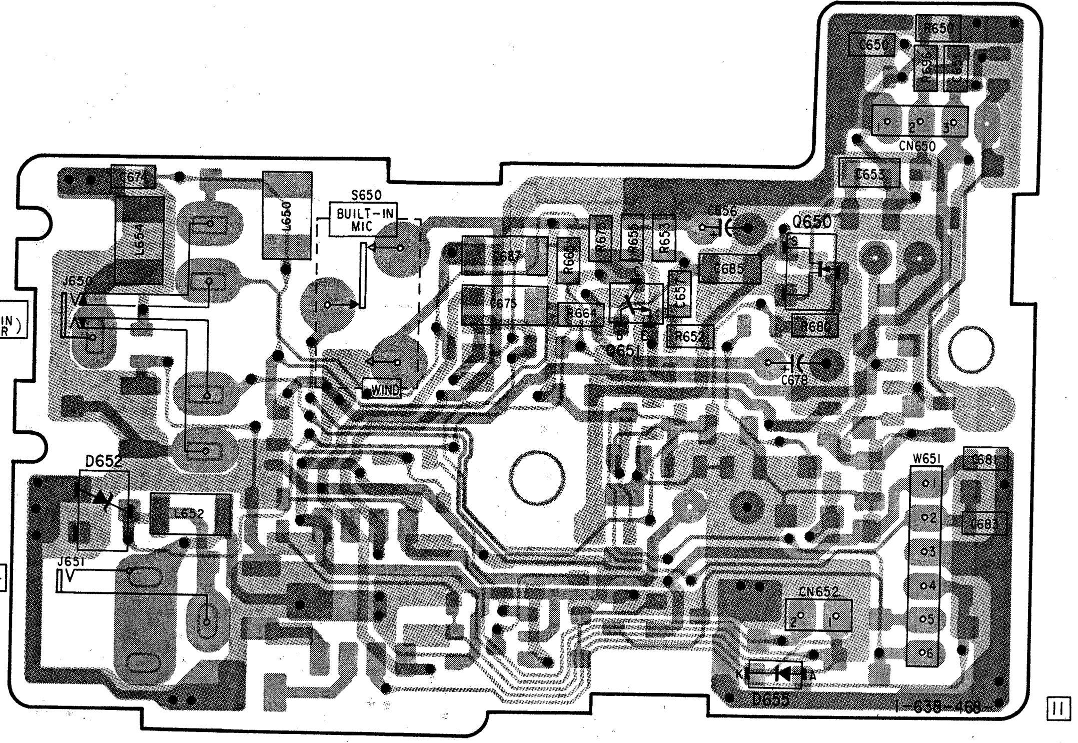
Q650	8-729-109-44	2SK94
Q651	8-729-905-35	2SC4081-R

MC-76 BOARD (COMPONENT SIDE)


R682
C652
R651
C655
C659
R654
R656
IC650
R681
L653
C677
S651
REC START/STOP
04

MIC (PLUG IN POWER)
DC OUT

MC-76 BOARD (CONDUCTOR SIDE)


R650
C650
CN650
C653
R674
L654
L650
S650
BUILT-IN MIC
J650
WIND
C656
Q650
R687
R675
R666
R670
R655
R653
C685
R664
Q651
C657
R652
R680
C678
D652
L652
J651
W651
R681
R683
CN652
D655
1-638-488-11

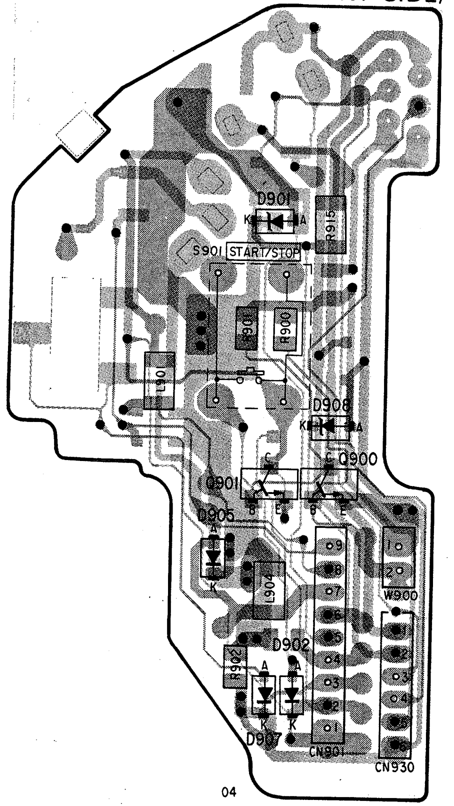
< DIODE >

D900	8-719-977-34	DTZ12
D901	8-719-977-34	DTZ12
D902	8-719-404-46	MA110
D903	8-719-977-34	DTZ12
D905	8-719-404-46	MA110
D906	8-719-404-46	MA110
D907	8-719-404-46	MA110
D908	8-719-976-97	DTZ5. 1

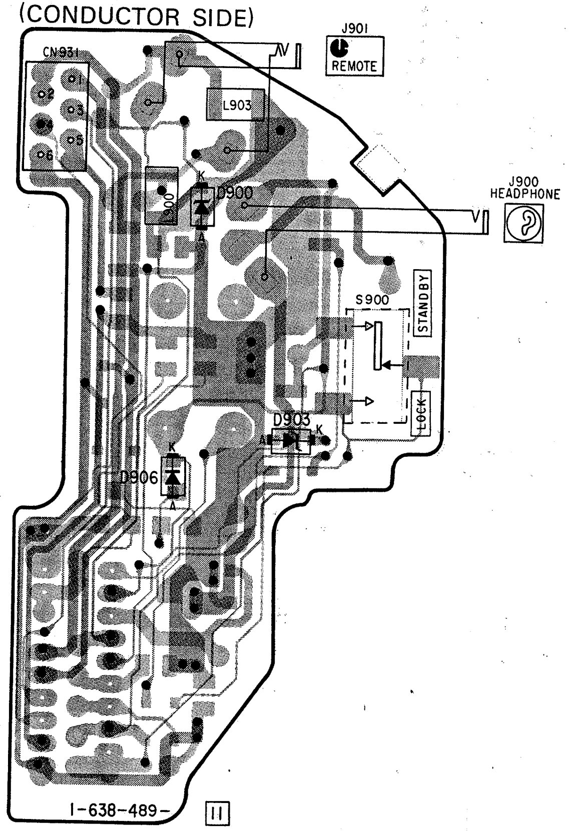
< TRANSISTOR >

Q900	8-729-901-01	DTC144EK
Q901	8-729-902-XX	DTC114TK

SW-183 BOARD (COMPONENT SIDE)

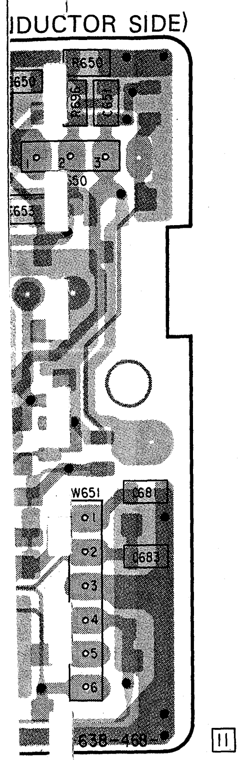

D901
R915
S901 START/STOP
R901
R900
L901
D908
Q901
Q900
D905
L904
W900
D902
R902
D907
CN901
CN930
04

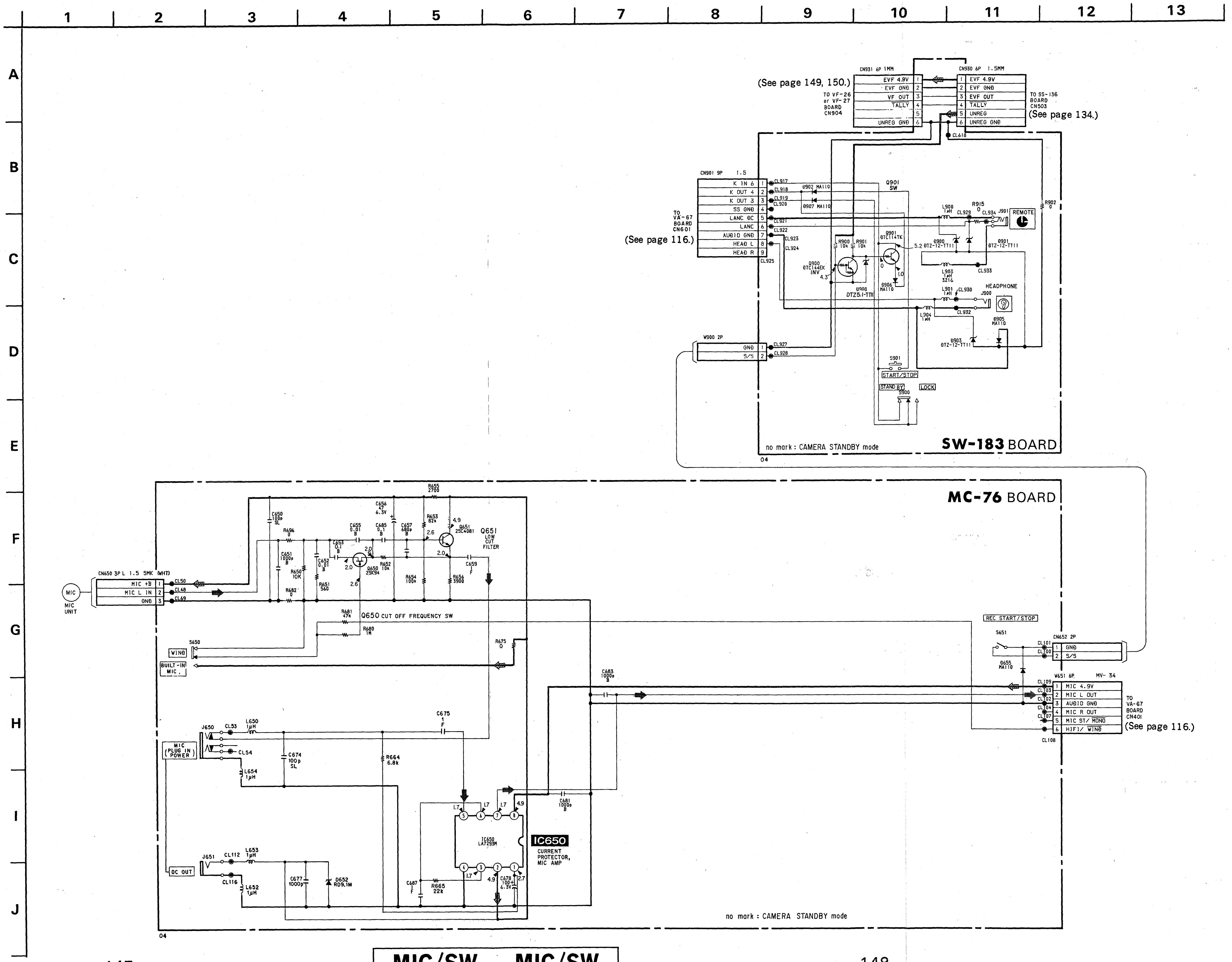
SW-183 BOARD (CONDUCTOR SIDE)


J901
REMOTE
CN931
L903
R900
D900
J900
HEADPHONE
S900
STANDBY
LOCK
D903
D906
1-638-489-11

MC-76 (MIC), SW-183 (SWITCH, JACK) SCHEMATIC DIAGRAM

—Ref. No. MC-76 and SW-183 BOARDS: 4000 series—


IDUCTOR SIDE)
R650
W651
D681
D683
638-468-
11

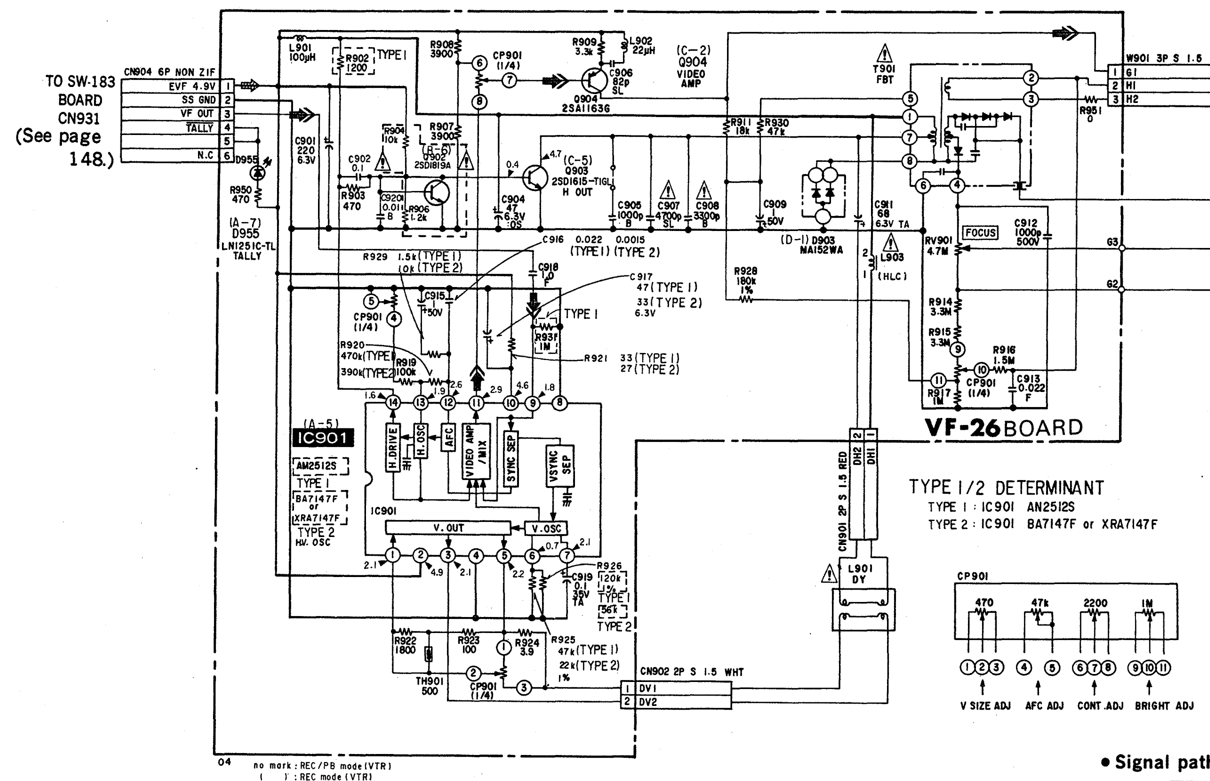

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
(See page 149, 150.)
TO VF-26 or VF-27 BOARD CN904
CN931 6P 1MM
EVF 4.9V 1
EVF GND 2
VF OUT 3
TALLY 4
5
UNREG GND 6
CN930 6P 1.5MM
1 EVF 4.9V
2 EVF GND
3 EVF OUT
4 TALLY
5 UNREG
6 UNREG GND
TO SS-136 BOARD CN503
(See page 134.)
CL618
CN901 9P 1.5
K IN 6 1
K OUT 4 2
K OUT 3 3
SS GND 4
LANC DC 5
LANC 6
AUDIO GND 7
HEAD L 8
HEAD R 9
TO VA-67 BOARD CN601
(See page 116.)
CL917
CL918
CL919
CL920
CL921
CL922
CL923
CL924
CL925
D902 MA110
D907 MA110
Q901 SW
R900 10k
R901 10k
Q900 DTC144EK INV
4.3
D908 DTZ5.1-TTI1
Q901 DTC114TK
0
1.0
D906 MA110
5.2
D900 DTZ-12-TT11
D901 DTZ-12-TT11
L900 1μH
CL929
R915 0
CL934
J901
REMOTE
R902 0
L903 1μH 3216
CL933
L901 1μH
CL930
HEADPHONE
J900
L904 1μH
CL932
D905 MA110
D903 DTZ-12-TT11
W900 2P
GND 1
S/S 2
CL927
CL928
S901
START/STOP
STAND BY
S900
LOCK
no mark : CAMERA STANDBY mode
SW-183 BOARD
04
MC-76 BOARD
MIC
MIC UNIT
CN650 3P L 1.5 SMK (WHT)
MIC +B 1
MIC L IN 2
GND 3
CL50
CL48
CL69
C650 100p SL
R696 0
C651 1000p B
R650 10K
R682 0
C652 0.01 B
R651 560
C653 0.1 B
C655 0.01 B
C685 0.1 B
C656 47 6.3V
C657 680p B
R655 2700
R653 82k
R652 10k
Q650 2SK94
2.0
2.6
R654 100k
R656 3900
Q651 2SC4081
4.9
Q651 LOW CUT FILTER
C659 1 F
R681 47k
R680 1M
Q650 CUT OFF FREQUENCY SW
S650
WIND
BUILT-IN MIC
R675 0
C683 1000p B
REC START/STOP
S651
CN652 2P
CL101
CL100
1 GND
2 S/S
D655 MA110
W651 6P
MV-34
CL109
CL103
CL102
CL104
CL107
CL108
1 MIC 4.9V
2 MIC L OUT
3 AUDIO GND
4 MIC R OUT
5 MIC ST/ MONO
6 HIFI/ WIND
TO VA-67 BOARD CN401
(See page 116.)
J650
CL53
L650 1μH
CL54
MIC (PLUG IN POWER)
C674 100p SL
L654 1μH
R664 6.8k
C675 1 F
1.7
4.9
2.7
IC650 LA7293M
IC650
CURRENT PROTECTOR, MIC AMP
C681 1000p B
J651
CL112
L653 1μH
DC OUT
CL116
L652 1μH
C677 1000p
D652 RD9.1M
C687 1 F
R665 22k
C678 100 6.3V
no mark : CAMERA STANDBY mode
04

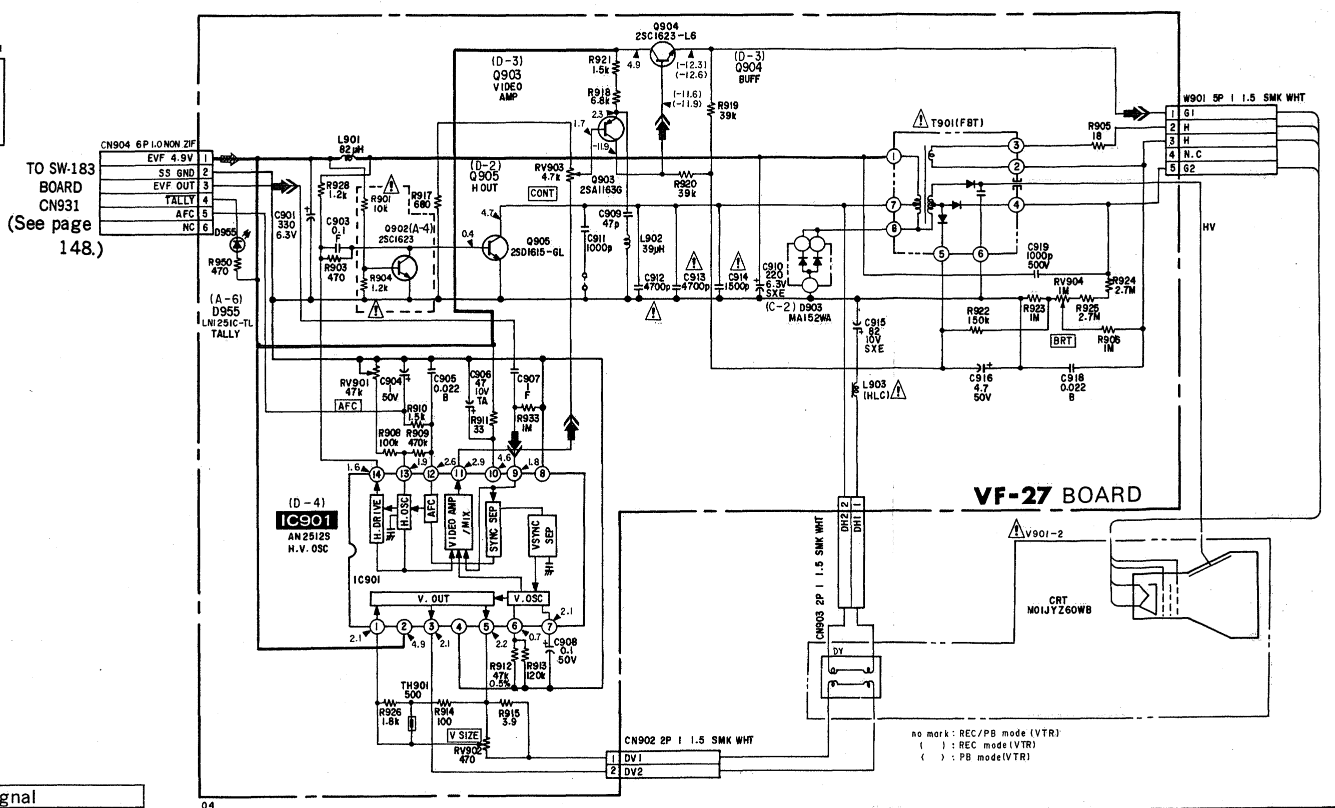
• Signal path

	AUDIO Signal
REC	➡

VF-26, VF-27 (VIEWFINDER) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

—Ref. No. VF-26 BOARD: 6000 series, VF-27 BOARD: 7000 series—


TO SW-183 BOARD CN931 (See page 148.)
CN904 6P NON ZIF
EVF 4.9V
SS GND
VF OUT
TALLY
N.C
D955 LN1251C-TL TALLY
IC901
W901 3P S 1.5
CRT901 CRT SOCKET
V901-1
CRT M01KG6007WB
T901 FBT
Q904 2SA1163G
Q903 2SD1615-T1GL H OUT
D903 MA152WA
L903 (HLC)
FOCUS
VF-26 BOARD
TYPE 1/2 DETERMINANT
TYPE 1 : IC901 AN2512S
TYPE 2 : IC901 BA7147F or XRA7147F
CP901
V SIZE ADJ
AFC ADJ
CONT.ADJ
BRIGHT ADJ
CN902 2P S 1.5 WHT
DV1
DV2
L901 DY
no mark : REC/PB mode (VTR)
( ) : REC mode (VTR)
( ) : PB mode (VTR)


TO SW-183 BOARD CN931 (See page 148.)
CN904 6P L0N0N ZIF
EVF 4.9V
SS GND
EVF OUT
TALLY
AFC
NC
D955 LN1251C-TL TALLY
Q903 VIDEO AMP
Q904 2SC1623-L6
Q904 BUFF
Q905 2SD1615-GL
Q902 2SC1623
T901 (FBT)
W901 5P I 1.5 SMK WHT
D903 MA152WA
L903 (HLC)
IC901 AN2512S H.V. OSC
VF-27 BOARD
V901-2
CRT M01JYZ60WB
CN903 2P I 1.5 SMK WHT
CN902 2P I 1.5 SMK WHT
DV1
DV2
no mark : REC/PB mode (VTR)
( ) : REC mode (VTR)
( ) : PB mode (VTR)

• Signal path

	VIDEO Signal		
	CHROMA	Y	Y/CHROMA
REC	➡	➡»	➡⋙

< DIODE >

D903	8-719-400-20	MA152WA
D955	8-719-404-19	LN1251C

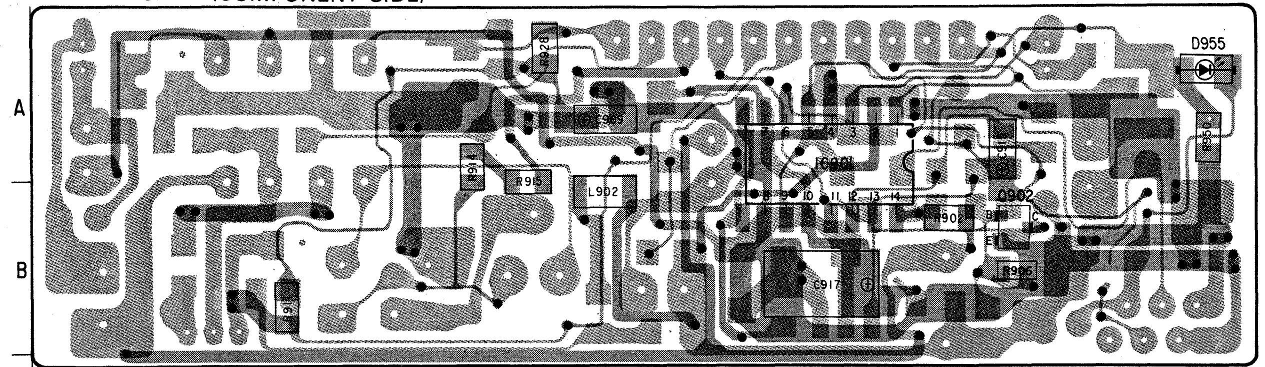
< IC >

IC901	8-759-420-01	AN2512S-T1 (TYPE1)
IC901	8-759-511-01	BA7147F (TYPE2)

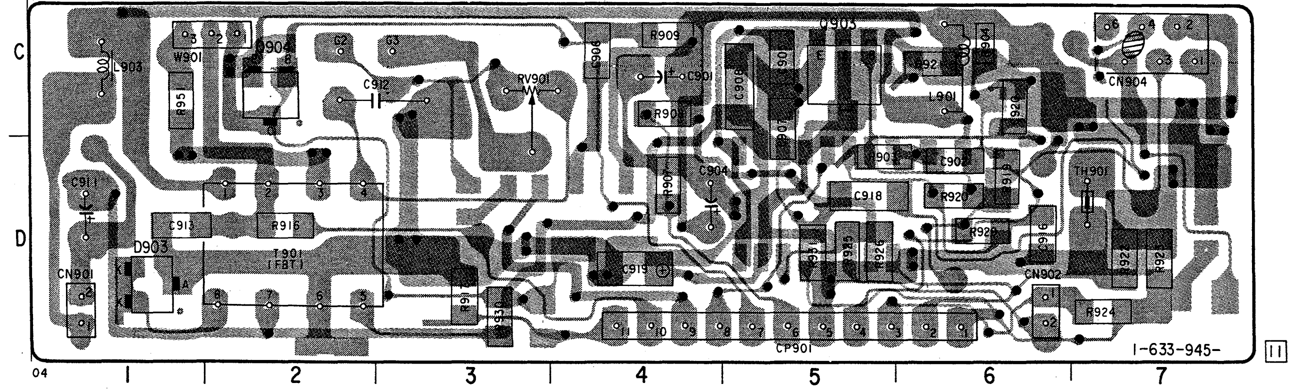
< TRANSISTOR >

Q902	· 8-729-402-31	2SD1819A
Q903	8-729-106-68	2SD1615A
Q904	8-729-216-31	2SA1163G

VF-26 BOARD (COMPONENT SIDE)


A
B
D955
R928
IC901
L902
Q902
C917

VF-26 BOARD (CONDUCTOR SIDE)


C
D
W901
Q903
RV901
C912
L901
TH901
CN904
C911
C913
D903
T901 (FBT)
CN901
CN902
CP901
1-633-945-
11
04
1
2
3
4
5
6
7

< DIODE >

D903	8-719-400-20	MA152WA
D955	8-719-404-19	LN1251C

< IC >

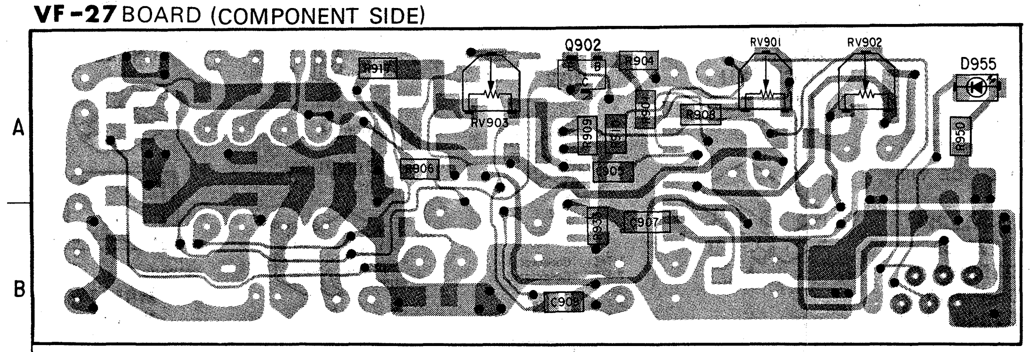
IC901	8-759-420-01	AN2512S

< TRANSISTOR >

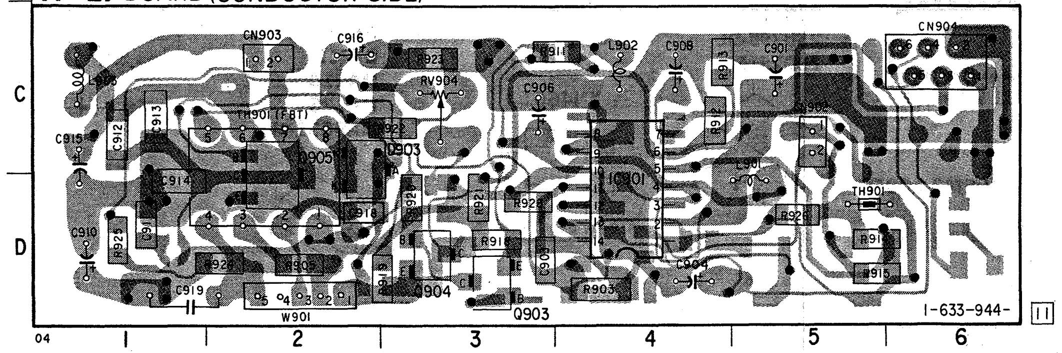
Q902	· 8-729-100-66	2SC1623
Q903	8-729-216-31	2SA1163
Q904	8-729-100-66	2SC1623
Q905	8-729-106-68	2SD1615A

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

VF-27 BOARD (COMPONENT SIDE)

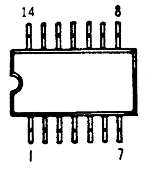

A
B
Q902
RV901
RV902
D955
RV903
R904

VF-27 BOARD (CONDUCTOR SIDE)


C
D
CN903
C916
CN904
RV904
C905
T901 (FBT)
Q905
Q903
Q904
TH901
W901
C919
C915
1-633-944-
11
04
1
2
3
4
5
6

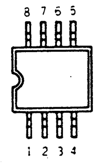
4-3. SEMICONDUCTORS

AN2512S
BA7147F
CXA8010M
LM324D
XRU4011BF
XRU4066BF



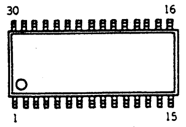
(TOP VIEW)

AK93C46F
BR93CS46F
HA118070FP
LA7293M
LM358D
LM393D
NJM2233AM
NJM2234M
NJM2235M
RC3414M
μPC393G2



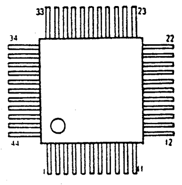
(TOP VIEW)

CXA1127M
CXA8006M

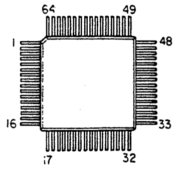


(Top view)

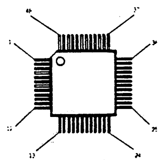
CXA1204Q


33
23
34
22
44
12

CXA1207R
MC68HC11E9

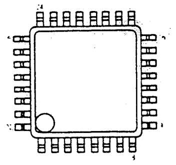

64
49
1
48
16
33
17
32

CXA1208R
CXA1392R
CXA1488R
MB3783PFV
MB673198U



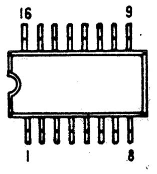
(TOP VIEW)

CXA1516Q
CXD1159Q



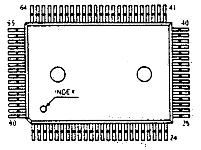
MARKING SIDE VIEW

CXA1448N
CXL5002M
MC14028BF
SN74HC4040NS



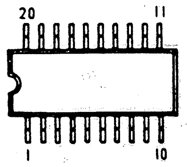
(TOP VIEW)

CXP80116
μPD75316GF



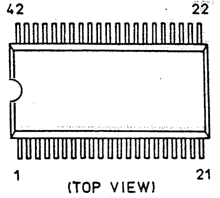
MARKING SIDE VIEW

MB88341PFV
MPC1737M
M62352GP
μPD6451AG
μPD7564G-540



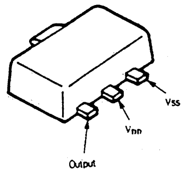
(TOP VIEW)

M34206M2-109FP

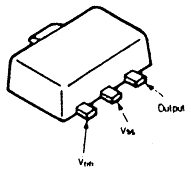


(TOP VIEW)

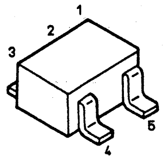
S-8054ALB-LM-S


Vss
VDD
Output

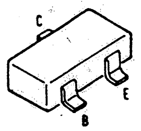
S-81250HG-RD-S


Output
Vss
VDD

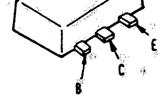
TC4S66F



2SA1163
2SA1576-R
2SB624-BV345
2SC1623
2SC2223-F13
2SC3395
2SC4081-R
2SD1819A
DTA144EU
DTC114EU
DTC114TK
DTC114TU
DTC144EK
DTC144EU
UN5212
UN5215

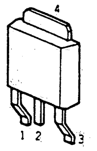


2SB1115A
2SB1121
2SB798-DL
2SD1615

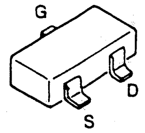


2SB1202FA

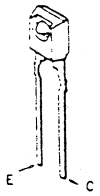
1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR



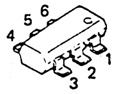
2SK1332-3
2SK300
2SK94



EE-109

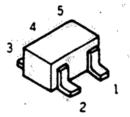


FC101

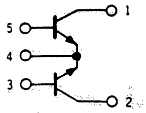


1 : 1E, 2 : 1B, 3 : 2C,
4 : 2E, 5 : 2B, 6 : 1C

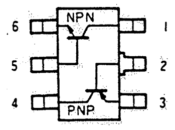
FMA2
FMG2



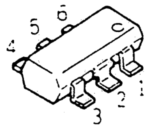
1 Tr1 : Collector 1
2 Tr2 : Collector 2
3 Tr2 : Base 2
4 Tr1, 2 : Emitter
5 Tr1 : Base 1



XN4601

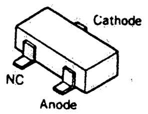

6
5
4
NPN
PNP
1
2
3

XN6213
XN6215
XN6401
XN6501

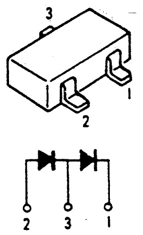


1: 1C, 2: 1B, 3: 2C,
4: 2B, 5: 2E, 6: 1E

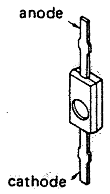
1SS196
SB10-05PCP


Cathode
NC
Anode

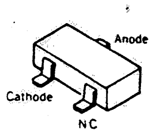
1SS226



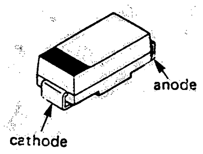
1T32


anode
cathode

DAN202U

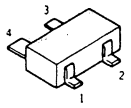

Anode
Cathode
NC

DTZ5.1
DTZ12
MA110
MA728
MA8051-M

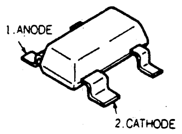

anode
cathode

DWA010
MA151A

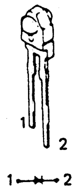
1. cathode
2. cathode
3. anode
4. anode



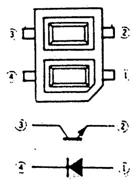
GL1HD51


1. ANODE
2. CATHODE

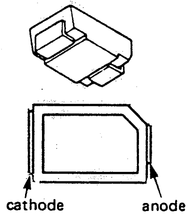
GL452S



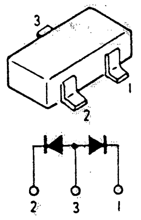
GP2S09-B
TLP907



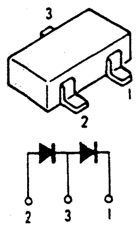
LN1251C


cathode
anode

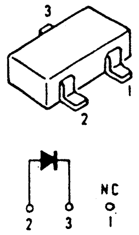
MA141WA
MA152WA



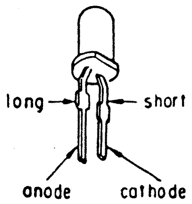
MA143



MA151K
SB05-05CP



TLR124


long
short
anode
cathode

SECTION 5
EXPLODED VIEWS

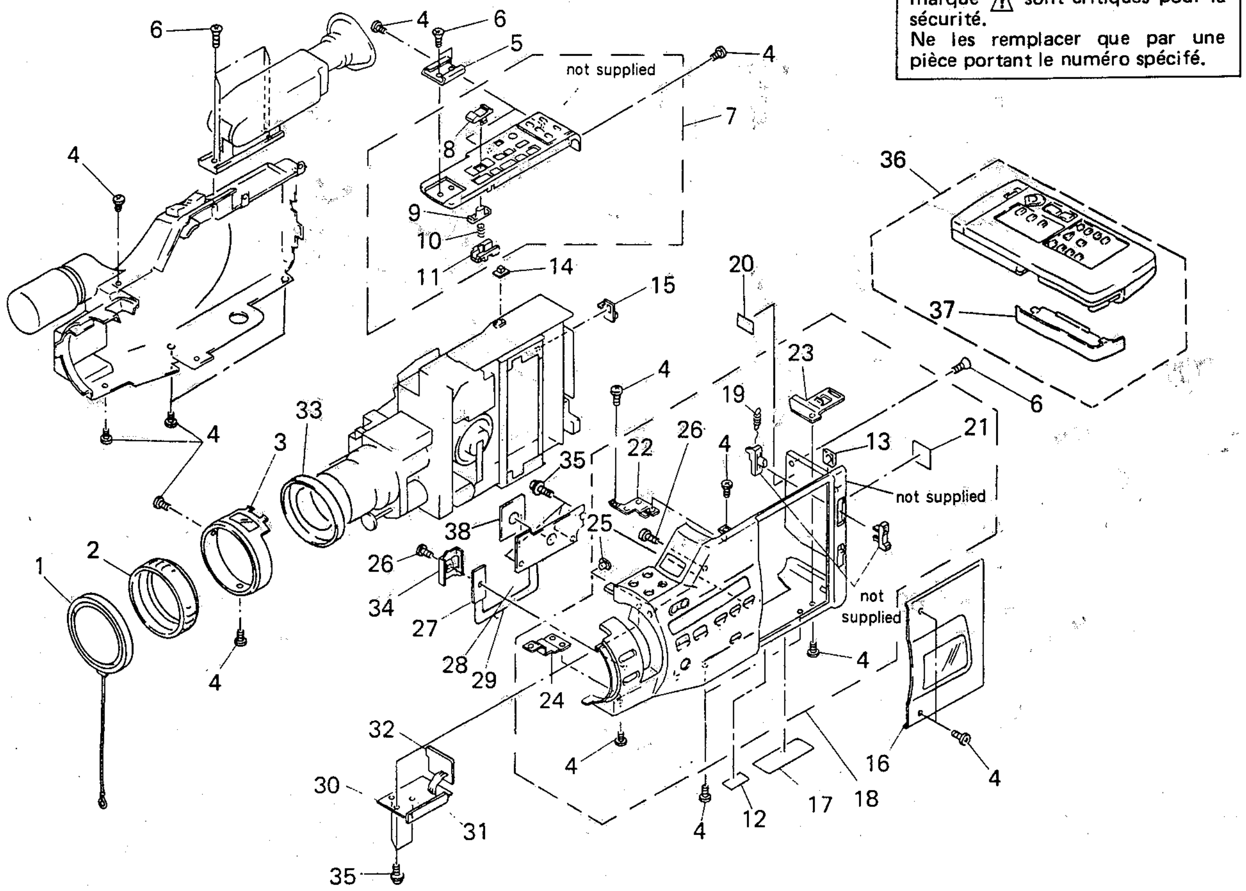
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE)...(RED)
  ↑ Parts Color ↑ Cabinet's Color
- Hardware(# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

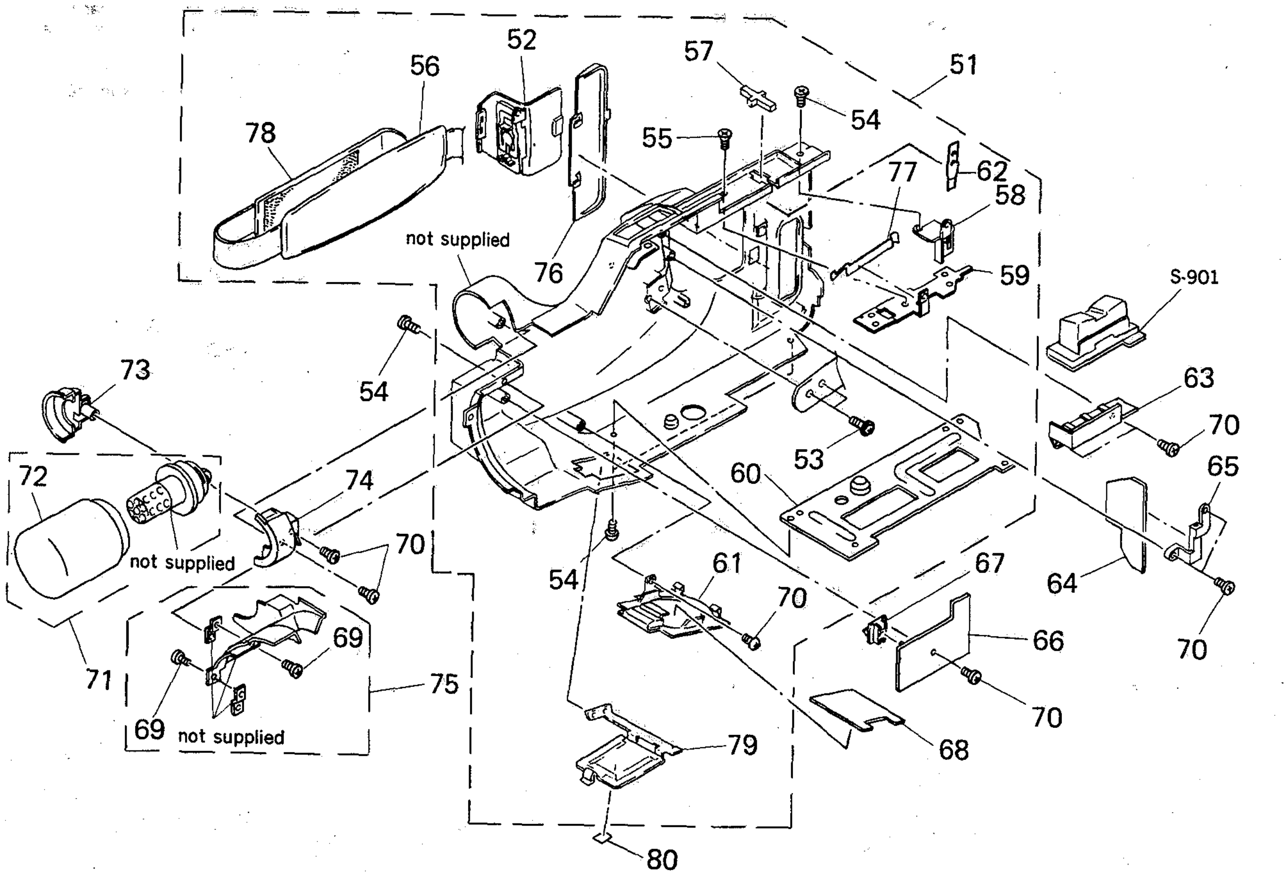
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifé.

5-1. CABINET (R) AND VTR PANEL (L) ASSEMBLIES



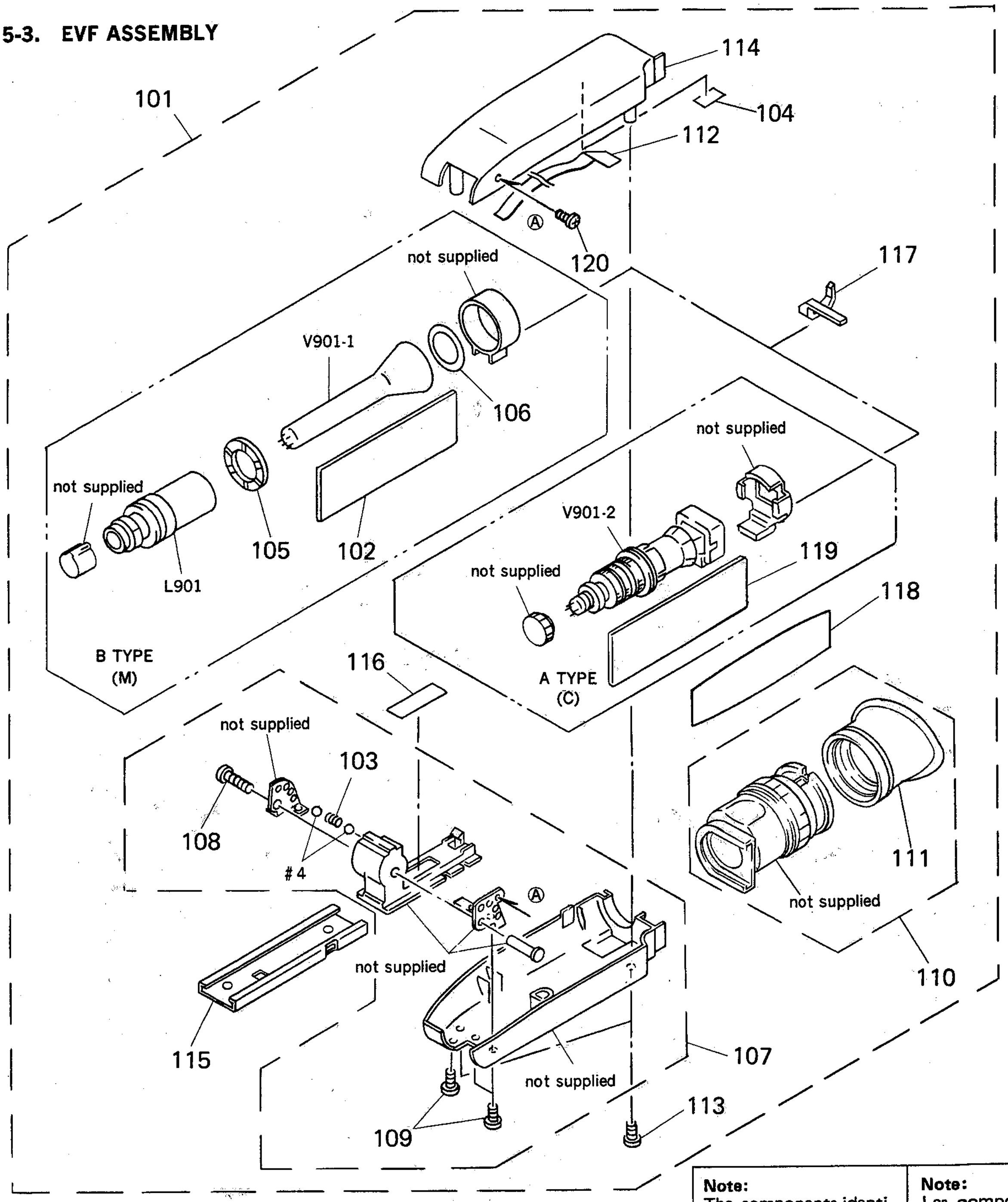
Ref. No.	Part No.	Description	Remark
1	A-7090-806-A	CAP ASSY, HOOD	
2	3-728-269-01	HOOD	
3	X-3940-366-1	HOOP ASSY, LENS (F401)	
	X-3940-600-1	HOOP ASSY, LENS (F402)	
4	3-719-381-01	SCREW (M2X4)	
5	3-724-511-01	SHOE, ACCESSORY	
6	3-719-831-21	SCREW (M2X4)	
7	X-3940-406-1	PANEL (M) ASSY, VTR (F401)	
	X-3940-605-1	PANEL (M) ASSY, VTR (F402)	
8	3-744-723-01	BUTTON (10), POWER	
9	* 3-718-257-11	BUTTON, PUSH, POWER	
10	* 3-303-973-00	SPRING, COMPRESSION	
11	3-744-815-01	PLATE, BLIND, POWER	
12	* 3-704-367-01	LABEL (F401/F402, US)	
13	3-718-233-01	NUT, PLATE	
14	3-941-708-01	BUTTON (60), EDIT (F401)	
	3-941-708-21	BUTTON (60), EDIT (F402)	
15	3-744-875-03	KNOB, REMOTE (F401)	
	3-744-875-13	KNOB, REMOTE (F402)	
16	X-3940-405-1	LID (M) ASSY, CASSETTE (F401)	
16	X-3940-610-1	LID (M) ASSY, CASSETTE (F402)	
17	* 3-941-809-01	LABEL, MODEL NUMBER (U/C) (F401)	
	* 3-942-594-01	LABEL, MODEL NUMBER (F402)	
18	X-3940-407-1	CABINET (R) ASSY (F401)	
	X-3940-606-1	CABINET (R) ASSY (F402)	
19	3-674-402-00	SPRING, TENSION	
20	* 3-744-888-01	LABEL, FUSE	
21	* 3-719-683-01	LABEL, BATTERY FITTING	
22	3-744-810-01	RETAINER, SHOE	
23	3-744-811-01	SHEET METAL (LOWER), STRAP	
24	3-744-821-01	JOINT, L/R	
25	3-744-847-01	GUIDE	
26	3-713-790-21	SCREW (M2X6), TAPPING, P3	
27	* 1-638-488-11	ZK-14 BOARD	
28	* A-7062-642-A	CK-50 BOARD, COMPLETE	
29	1-633-985-11	FP-298 FLEXIBLE BOARD	
30	* A-7062-641-A	DK-15 BOARD, COMPLETE	
31	* 1-638-490-11	ED-32 BOARD	
32	* A-7020-141-A	R BOARD, ASSY	
33	3-744-839-01	RING, CHANGE	
34	3-744-812-01	SHEET METAL, ZK	
35	3-669-480-21	+ PTPWH 2	
36	1-465-395-41	COMMANDER, REMOTE (RMT-502)	
37	3-942-755-01	COVER, BATTERY	
38	* 3-943-314-01	INSULATOR, CK	

5-2. CABINET (L) ASSEMBLY



Ref. No.	Part No.	Description	Remark
51	A-7081-546-A	CABINET (L) BLOCK ASSY (F401)	
	A-7081-611-A	CABINET (L) BLOCK ASSY (F402)	
52	X-3744-821-1	KNOB ASSY, SP (F402)	
	X-3744-825-1	KNOB ASSY, SP (F401)	
53	3-669-480-21	+ PTPWH 2	
54	3-744-720-11	SCREW (M2X3)	
55	3-719-831-21	SCREW (M2X4)	
56	3-724-591-01	PAD, GRIP	
57	3-744-709-01	LOCK, SLIDE	
58	3-744-804-01	SHEET METAL (UPPER), STRAP	
59	X-3744-828-1	RETAINER ASSY, EVF	
60	X-3749-071-1	SHEET METAL ASSY, TRIPOD (F401)	
	X-3940-613-1	SHEET METAL ASSY, TRIPOD (F402)	
61	3-744-841-01	HOLDER, LI PC BOARD	
62	3-744-872-01	SPRING, CN	
63	3-744-805-01	BUTTON (BASE), ZOOM	
64	* A-7071-369-A	SW-183 BOARD, COMPLETE	
65	3-744-808-01	RETAINER, SW	
66	* A-7062-643-A	MC-76 BOARD, COMPLETE	
67	3-744-807-11	BUTTON, MICROPHONE (F402)	
	3-744-807-41	BUTTON, MICROPHONE (F401)	
68	* 1-638-494-11	LI-39 BOARD	
69	3-744-720-11	SCREW (M2X3)	
70	3-713-790-21	SCREW (M2X6), TAPPING, P3	
71	1-542-125-21	MICROPHONE (C-2027)	
72	3-707-650-11	SCREEN, WIND	
73	3-744-833-01	HOLDER, MICROPHONE (F401)	
	3-744-833-11	HOLDER, MICROPHONE (F402)	
74	3-744-834-01	HOUSING, MICROPHONE (F401)	
	3-744-834-11	HOUSING, MICROPHONE (F402)	
75	X-3744-803-1	COVER ASSY, LENS (F401)	
75	X-3744-819-1	COVER ASSY, LENS (F402)	
76	3-744-874-21	LID, CONNECTOR (F401)	
	3-744-874-31	LID, CONNECTOR (F402)	
77	3-744-876-01	SPRING, EVF LOCK	
78	3-719-323-01	BELT, GRIP	
79	3-744-840-01	LID, BATTERY CASE (F401)	
80	* 3-704-256-01	LABEL, CAUTION (F401/F402, US)	
S901	1-572-286-11	SWITCH, PUSH (ZOOM)	

5-3. EVF ASSEMBLY



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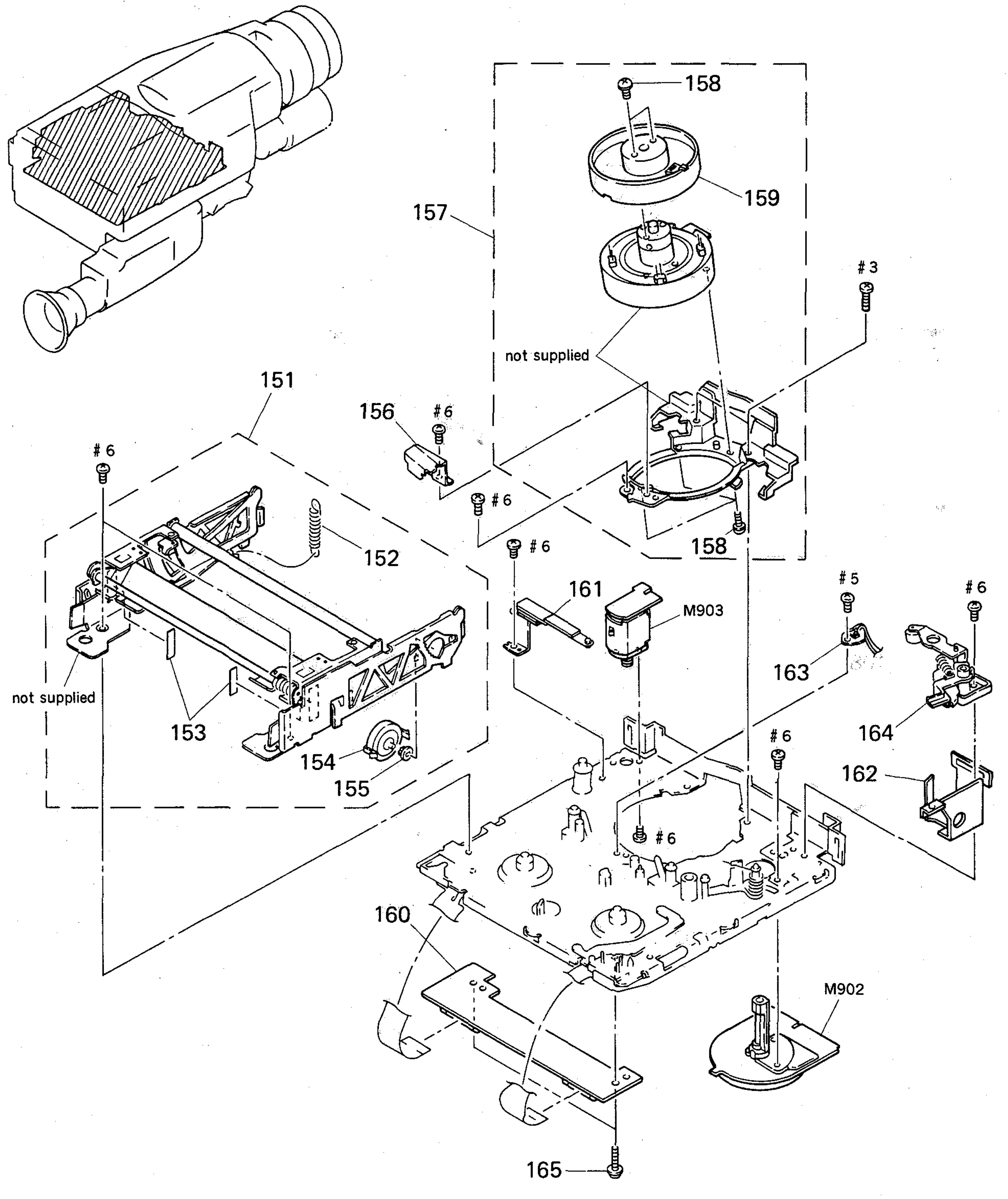
Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
101	A-7019-282-A	EVF (M) ASSY (B TYPE) (F401)	
	A-7019-303-A	EVF (M) ASSY (B TYPE) (F402)	
102	* A-7062-124-A	VF-26 BOARD, COMPLETE(B TYPE)	
103	3-302-492-00	SPRING, COMPRESSION	
104	* 3-728-656-01	LABEL, MEASUREMENT	
105	3-724-549-01	LOCK, CRT (B TYPE)	
106	3-724-570-01	RING, CRT FIXED (B TYPE)	
107	X-3744-701-1	CASE ASSY, LOWER, VF (F401)	
	X-3744-837-1	CASE ASSY, LOWER, VF (F402)	
108	3-732-012-11	SCREW (M2X5)	
109	3-744-720-11	SCREW (M2X3)	
110	X-3940-369-1	FINDER (S) ASSY, SPORTS (F401)	
	X-3940-611-1	FINDER (S) ASSY, SPORTS (F402)	
111	3-749-142-01	EYE CUP	

Ref. No.	Part No.	Description	Remark
112	1-634-011-11	FP-264 FLEXIBLE BOARD	
113	3-713-790-31	SCREW (M2X8), TAPPING, P3	
114	3-744-705-01	CASE, VF (UPPER) (F401)	
	3-744-705-11	CASE, VF (UPPER) (F402)	
115	3-744-712-01	SHOE, VF	
116	3-744-716-01	COVER, FL	
117	3-744-722-01	GUIDE, VF TALLY	
118	3-744-775-01	INSULATOR, VF	
119	* A-7062-125-A	VF-27 BOARD, COMPLETE (A TYPE)	
120	3-744-720-11	SCREW (M2X3)	
L901	⚠ 1-451-310-21	DEFLECTION YOKE (B/W) (B TYPE)	
V901-1	⚠ 1-546-085-11	CATHODE-RAY TUBE, B/W (B TYPE)	
V901-2	⚠ 1-452-482-11	CRT ASSY (M91JYZ6OWB) (A TYPE)	

5-4. MECHANICAL DECK ASSEMBLY (1)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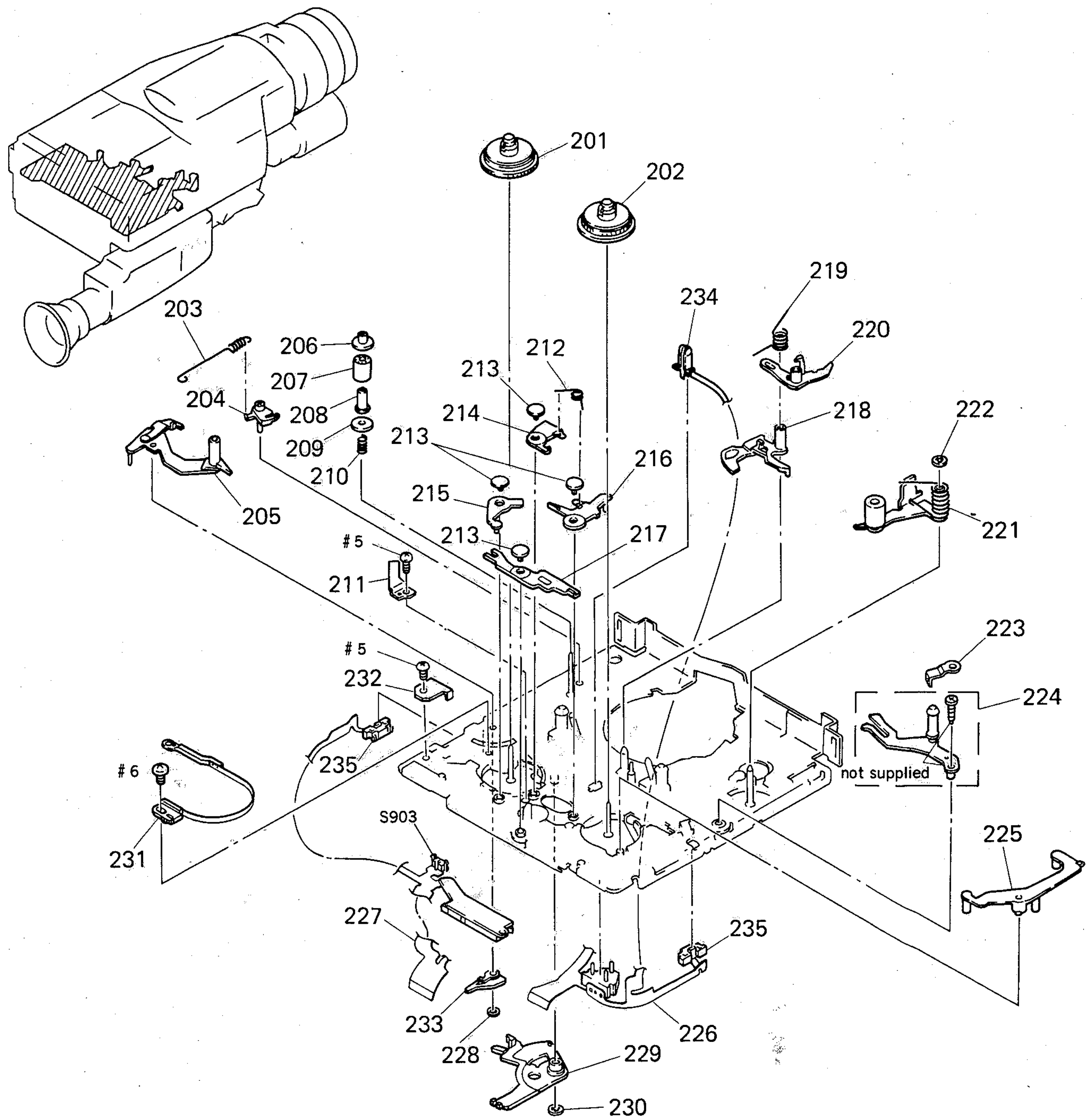
Ref. No.	Part No.	Description	Remark
151	X-3728-874-1	CASSETTE COMPARTMENT ASSY (N)	
152	3-728-825-03	SPRING, TENSION	
153	* 3-728-829-01	TAPE	
154	3-728-867-02	DAMPER, OIL	
155	3-728-828-02	GEAR, DAMPER	
156	3-728-868-01	GUARD, GUIDE	
157	A-7048-357-A	DRUM ASSY (DGU-57A-R)	
158	3-686-493-01	SCREW (M2X5), P1	
159	A-7049-307-A	DRUM ASSY, ROTARY (UPPER) (DGR-57-R)	

Ref. No.	Part No.	Description	Remark
160	* 1-638-470-11	CC-61 BOARD	
161	X-3728-864-1	GROUND ASSY, SHAFT	
162	3-744-114-01	BASE (RP)	
163	1-808-505-12	SENSOR (DEW)	
164	A-7040-205-A	ROLLER BLOCK ASSY (RP), HC	
165	3-713-790-01	SCREW (M2X5), TAPPING, P3	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING (LOADING)	

5-5. MECHANICAL DECK ASSEMBLY (2)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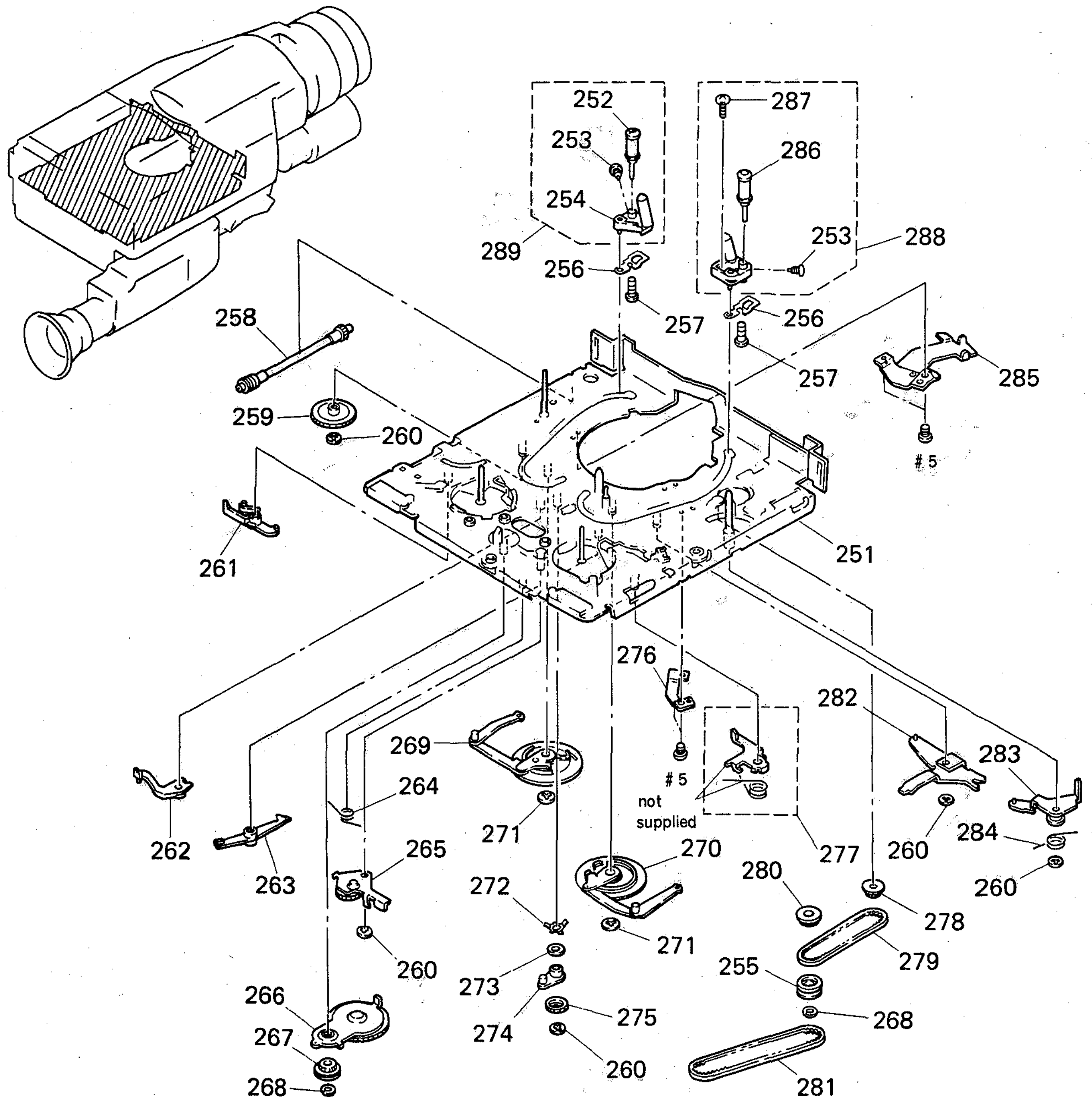
Ref. No.	Part No.	Description	Remark
201	X-3728-851-1	TABLE ASSY, REEL, S	
202	X-3728-855-1	TABLE ASSY, REEL, T	
203	3-736-414-01	SPRING, TENSION	
204	3-728-855-03	ARM, ADJUSTMENT	
205	X-3728-867-1	ARM ASSY (S), TENSION REGULATOR	
206	3-726-884-01	FLANGE, UPPER, TG2	
207	3-726-883-01	ROLLER, TG2	
208	3-726-885-01	SLEEVE, TG2	
209	3-726-882-02	FLANGE, LOWER, TG2	
210	3-726-886-01	SPRING, COMPRESSION	
211	3-726-848-01	RETAINER, TL	
212	3-726-866-01	SPRING (ST), TORSION	
213	3-726-858-01	PIN, SHAFT RETAINER	
214	3-728-849-01	BRAKE, S	
215	3-726-852-01	BRAKE, LB	
216	3-728-850-01	BRAKE, T	
217	3-726-853-01	LEVER, LB	
218	3-728-875-01	STOPPER, RK	
219	3-726-864-01	SPRING (RK), TORSION	
220	3-728-852-02	ARM, RK STOPPER	
221	A-7040-219-A	ARM BLOCK ASSY, PINCH	
222	3-669-465-00	WASHER (1.5), STOPPER	
223	3-728-808-01	SPRING, LEAF	
224	X-3728-869-1	ARM ASSY, TG7	
225	3-728-848-01	ARM, LB RELEASE	
226	1-628-061-12	FP-90 FLEXIBLE BOARD	
227	1-628-060-12	FP-89 FLEXIBLE BOARD	
228	3-321-393-11	WASHER, STOPPER	
229	X-3728-863-1	LEVER ASSY, SW	
230	3-726-829-01	WASHER, STOPPER	
231	X-3728-859-1	BAND ASSY, TENSION REGULATOR	
232	3-730-125-01	RETAINER, SW	
233	X-3728-857-1	STOPPER ASSY, TENSION REGULATOR	
234	3-728-837-01	HOLDER, LED	
235	3-728-869-02	HOLDER, SENSOR	
S903	1-571-099-11	SWITCH	

5-6. MECHANICAL DECK ASSEMBLY (3)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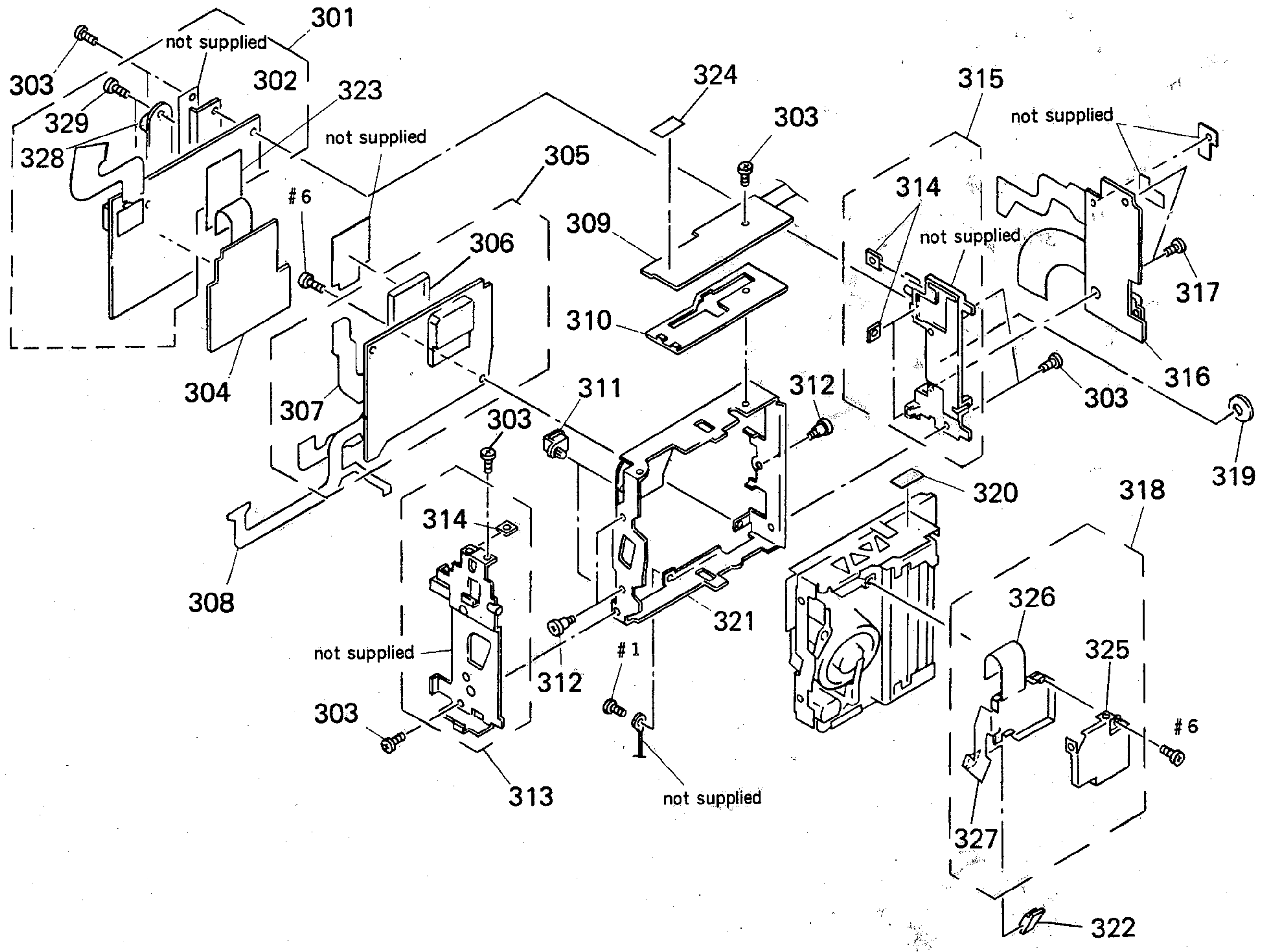
Ref. No.	Part No.	Description	Remark
251	X-3728-862-1	CHASSIS ASSY, MECHANICAL	
252	X-3726-820-1	ROLLER ASSY (U), GUIDE	
253	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD	
254	X-3726-818-1	COASTER (LEFT) ASSY	
255	3-741-196-01	PULLEY (LOWER), BELT MIDWAY	
256	3-736-485-01	SPRING, LEAF, COSTER	
257	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)	
258	X-3728-868-1	WORM ASSY	
259	3-744-109-01	GEAR, WHEEL	
260	3-726-829-01	WASHER, STOPPER	
261	3-728-842-01	LEVER, EJECT	
262	3-728-851-01	BRAKE, UL	
263	3-726-854-01	ARM, BRAKE RELEASE	
264	3-726-865-01	SPRING (LB), TORSION	
265	A-7040-225-A	GEAR BLOCK ASSY (N), LB	
266	X-3728-866-1	GEAR ASSY, RK	
267	X-3728-858-1	GEAR ASSY, RC	
268	3-321-393-11	WASHER, STOPPER	
269	X-3728-842-1	GEAR (LEFT) ASSY, DRIVE	
270	X-3728-843-1	GEAR (RIGHT) ASSY, DRIVE	
271	3-669-465-00	WASHER (1.5), STOPPER	
272	3-726-867-01	SPRING, LEAF	
273	3-701-436-21	WASHER, POLYEHTHYLENE	
274	3-726-857-03	ARM, UL	
275	3-726-856-04	GEAR, UL	
276	* 3-726-805-01	REINFORCEMENT (TT)	
277	X-3726-808-2	BRAKE ASSY, TS	
278	X-3726-805-1	GEAR ASSY, JOINT	
279	3-728-866-11	BELT (S), TIMING	
280	X-3726-813-1	PULLEY (UPPER) ASSY, MIDWAY	
281	3-741-197-01	BELT (L), TIMING	
282	X-3728-846-1	LEVER ASSY, THREADING	
283	X-3726-824-1	ARM ASSY, PINCH SUB	
284	3-726-895-01	SPRING	
285	X-3726-841-1	REINFORCEMENT (SS) ASSY	
286	X-3728-808-4	ROLLER ASSY (U) (PLATING), GUIDE	
287	3-736-473-01	SCREW (M2X0.25) (THREE LOCK)	
288	A-7040-217-A	COASTER (RIGHT) BLOCK ASSY (N1P)	
289	A-7040-128-A	COASTER (LEFT) BLOCK ASSY	

5-7. MAIN BOARD ASSEMBLY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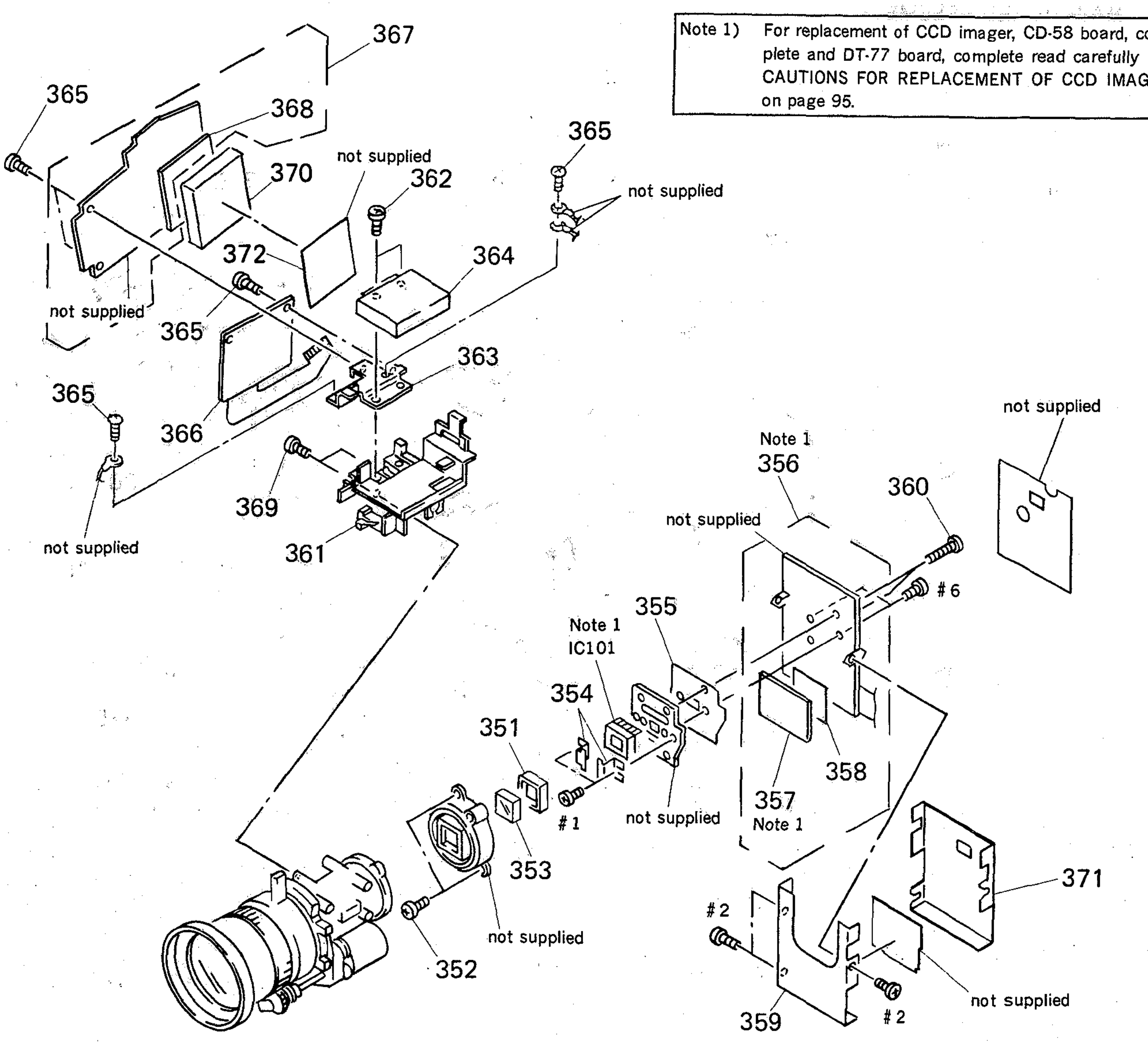
Ref. No.	Part No.	Description	Remark
301	* A-7062-637-A	VA-67 BOARD, COMPLETE	
302	X-3744-801-1	REINFORCEMENT ASSY, VA	
303	3-744-720-11	SCREW (M2X3)	
304	* A-7062-636-A	CT-38 BOARD, COMPLETE	
305	* A-7062-610-A	SS-136 BOARD, COMPLETE	
306	* X-3744-601-1	CASE ASSY (DD-B), SHIELD	
307	1-633-924-11	FP-248 FLEXIBLE BOARD	
308	1-633-922-11	FP-249 FLEXIBLE BOARD	
309	* A-7071-341-A	VK-14 BOARD, COMPLETE	
310	X-3940-614-1	PLATE ASSY, BOTTOM, VTR	
311	3-744-609-01	HINGE (C), PC BOARD	
312	3-744-603-21	SCREW	
313	X-3744-805-1	HOLDER ASSY, MD	
314	3-718-233-01	NUT, PLATE	

Ref. No.	Part No.	Description	Remark
315	X-3744-810-1	FRAME (R) ASSY, MD	
316	* A-7062-638-A	FU-100 BOARD, COMPLETE	
317	3-713-790-21	SCREW (M2X6), TAPPING, P3	
318	8-741-101-12	IC SBX1509-41 (HIC RP-77 BOARD, COMPLETE)	
319	1-529-096-11	BUZZER, PIEZOELECTRIC	
320	* 3-730-176-01	SHEET, MD	
321	X-3744-602-1	FRAME ASSY, MD	
322	1-569-347-11	CONNECTOR, FPC(TRANSLATION) 13P	
323	* 3-744-890-01	PLATE, PROTECTION, FLEXIBLE	
324	* 3-744-948-01	SHEET, ELECTROSTATIC, VK	
325	* 3-744-608-01	CASE (RP-77A), SHIELD	
326	1-633-891-11	FP-247 FLEXIBLE BOARD	
327	1-633-889-11	FP-246 FLEXIBLE BOARD	
328	1-537-142-21	TERMINAL BOARD	
329	3-719-695-01	SCREW (M1.7×3.5), SPECIAL HEAD	

5-8. CAMERA BLOCK ASSEMBLY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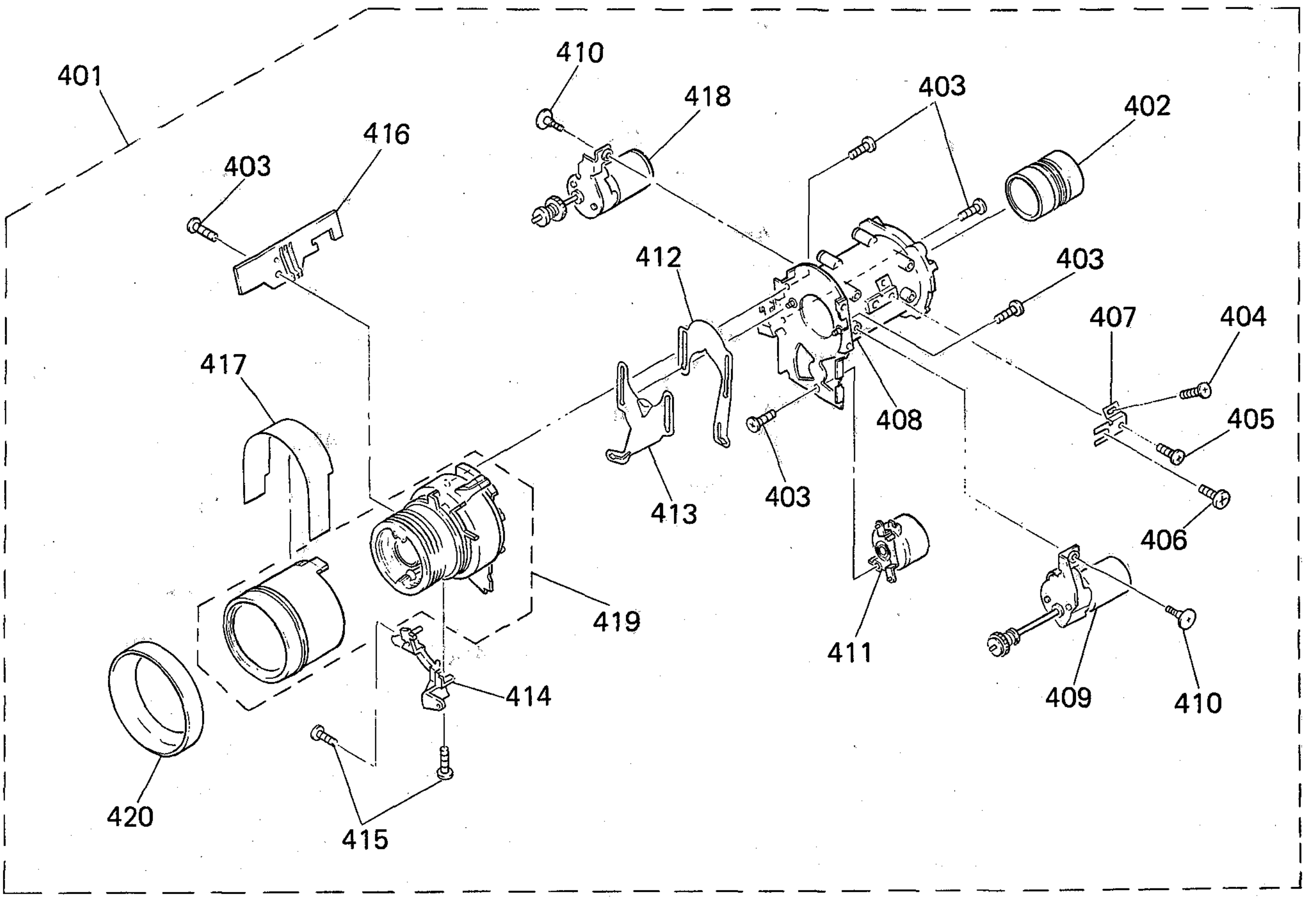
Note 1) For replacement of CCD imager, CD-58 board, complete and DT-77 board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 95.

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
351	* 3-725-177-01	RUBBER, SEAL	
352	3-738-519-11	SCREW (M2X3), +B	
353	1-547-357-12	FILTER BLOCK, OPTICAL	
354	* 3-725-175-01	STOPPER, CCD	
355	* 3-725-180-01	SHEET, INSULATING, CCD HOLDER	
356	* A-7062-634-A	CD-58 BOARD, COMPLETE (Note 1)	
357	A-7068-174-A	DT-77 BOARD, COMPLETE (HIC) (HIC121) (Note 1)	
358	* X-3739-811-1	PLATE ASSY, SHIELD, CD	
359	* X-3744-702-1	CASE (MAIN) ASSY, SHIELD, C	
360	3-335-640-51	SCREW (M2X16)	
361	* X-3744-808-1	HOLDER ASSY, LENS	
362	3-713-790-21	SCREW (M2X6), TAPPING, P3	
363	* 3-744-818-01	PLATE, GROUND, CAMERA	
364	⚠ 1-466-230-21	CONVERTER UNIT, D/D	
365	3-719-381-01	SCREW (M2X4)	
366	* A-7062-635-A	AF-85 BOARD, COMPLETE	
367	* A-7062-633-A	VC-94 BOARD, COMPLETE	
368	A-7068-187-A	MX-10 BOARD, COMPLETE (HIC) (HIC301)	
369	3-719-408-01	SCREW (B2), TAPPING, P3	
370	* 3-744-763-01	CASE, SHIELD, VC	
371	* 3-744-702-01	LID, C SHIELD CASE	
372	* 3-744-892-01	INSULATOR, VC	
IC101	8-752-604-98	IC ICX026CK-2 (CCD IMAGER) (Note 1)	

5-9. ZOOM LENS ASSEMBLY (1)
(VCL-8508XE)


401
410
418
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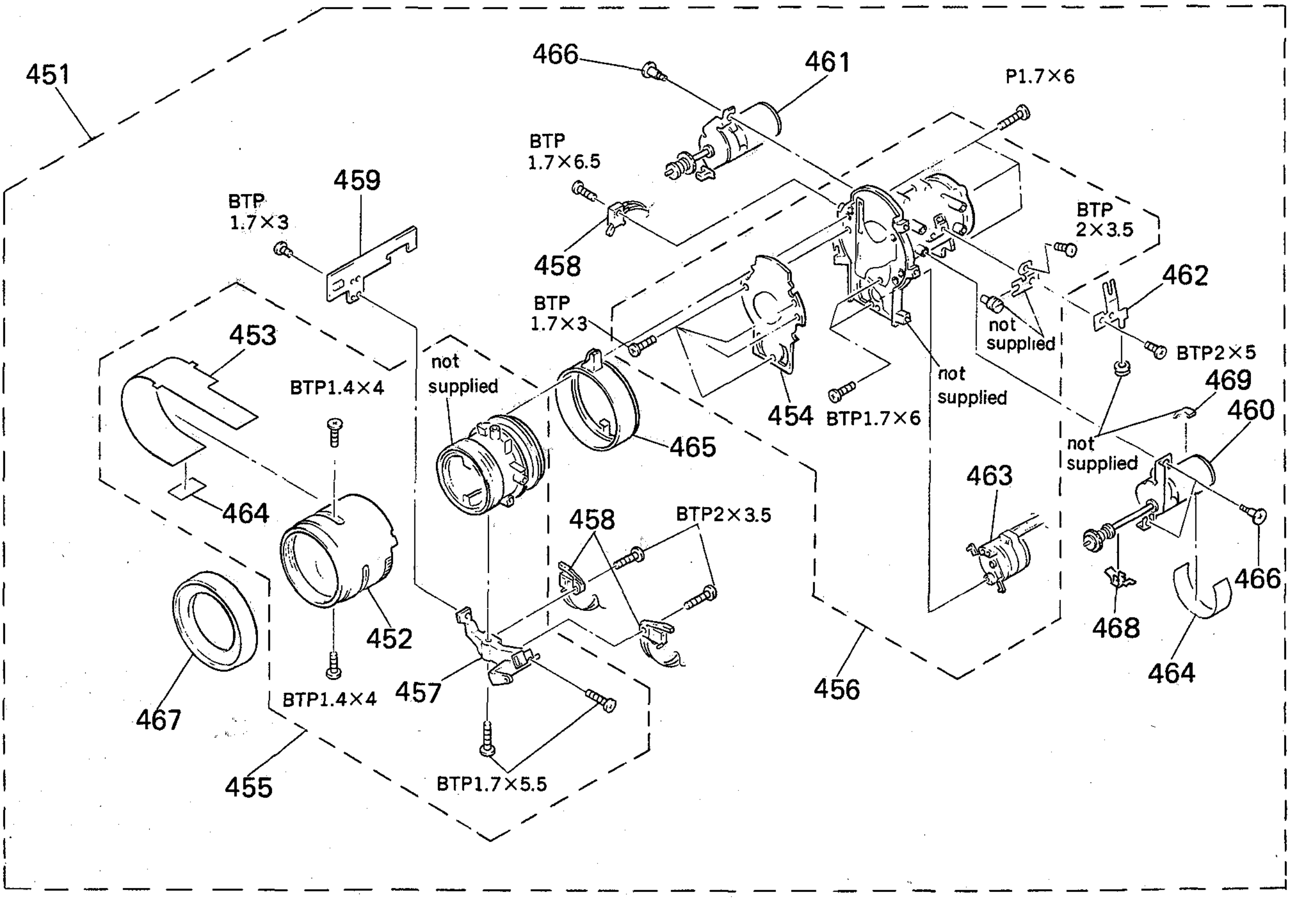
Ref. No.	Part No.	Description	Remark
401	1-547-422-11	LENS, ZOOM (VCL-8508XE)	
402	3-707-945-01	LENS ASSY, MASTER	
403	3-707-946-01	SCREW (M3X4.5)	
404	3-707-947-01	SCREW, MASTER LENS (M4X4)	
405	3-707-948-01	SCREW, TRACKING PLATE (M3.8X2.8)	
406	3-707-949-01	TOP	
407	3-707-950-01	PLATE, FIXED	
408	3-707-951-01	MIRROR TUBE, REAR	
409	3-707-952-01	MOTOR ASSY, AF	
410	3-707-953-01	SCREW, F.Z MOTOR (M6.3X6.1)	
411	3-707-954-01	METER ASSY, IRIS	
412	3-707-955-01	SHUTTLECOCK (A), IRIS	
413	3-707-956-01	SHUTTLECOCK (B), IRIS	
414	3-707-957-01	BRACKET	
415	3-707-958-01	SCREW, BRACKET (M3.5X5)	
416	3-707-959-01	CHASSIS, SENSOR	
417	3-707-961-01	SHEET, F	
418	3-707-962-01	MOTOR ASSY, PZ	
419	3-707-963-01	FZ ASSY	
420	3-744-839-01	RING, CHANGE	

5-10. ZOOM LENS ASSEMBLY (2)
(VCL-8508XF)


451
466
461
P1.7×6
BTP
1.7×6.5
459
BTP
1.7×3
458
BTP
2×3.5
462
BTP
1.7×3
453
not
supplied
BTP1.4×4
not
supplied
BTP2×5
469
454
BTP1.7×6
not
supplied
460
465
not
supplied
463
464
458
BTP2×3.5
466
452
468
467
BTP1.4×4
457
456
464
455
BTP1.7×5.5

Ref. No.	Part No.	Description	Remark
451	1-547-412-14	LENS, ZOOM (VCL-8508XF)	
452	3-707-965-01	RING ASSY (F)	
453	3-707-966-01	SHEET, (F) METER	
454	3-707-967-01	FRAME ASSY, 4 GROUP LENS	
455	3-707-968-01	MIRROR TUBE ASSY	
456	3-707-969-01	MIRROR TUBE ASSY, REAR	
457	3-707-970-01	BLACKET	
458	3-707-971-01	SW ASSY (Z)	
459	3-707-972-01	BOARD ASSY, SENSOR	
460	3-708-059-01	MOTOR ASSY, AF (2)	
461	3-707-974-01	MOTOR ASSY, PZ	
462	3-707-975-01	RETAINER, (F) MOTOR	
463	3-707-976-01	METER ASSY, IRIS	
464	3-707-977-01	TAPE, POLYESTER	
465	3-707-978-01	RING ASSY, ZOOM	
466	3-707-796-01	SCREW, MOTOR SET	
467	3-744-839-01	RING, CHANGE	
468	3-708-087-01	SPRING, (F) SHAFT RETAINER	
469	3-708-058-01	RUBBER	

SECTION 6
ELECTRICAL PARTS LIST

AF-85 CD-58 VC-94

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- CAPACITORS
  uF: μF
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD....

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
	* A-7062-635-A	AF-85 BOARD, COMPLETE (Ref. No 1,000 Series)			
	* A-7062-634-A	CD-58 BOARD, COMPLETE (Ref. No 1,000 Series) Note 1			
	* A-7062-635-A	VC-94 BOARD, COMPLETE ******************** (Ref. No 1,000 Series)			
	3-744-718-01	HOLDER (10), C			
		< CAPACITOR >			
C101	1-126-200-11	ELECT CHIP	10uF	20%	35V
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C104	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C105	1-126-607-11	ELECT CHIP	47uF	20%	4V
C107	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C110	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C111	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C112	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C113	1-128-013-11	ELECT CHIP	1uF	20%	50V
C114	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C121	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C122	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C123	1-135-091-00	TANTAL. CHIP	1uF	20%	16V
C124	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C125	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C126	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C127	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C128	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C129	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C130	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C131	1-162-638-11	CERAMIC CHIP	1uF		16V
C133	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C135	1-162-638-11	CERAMIC CHIP	1uF		16V
C141	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C142	1-135-145-11	TANTALUM CHIP	0.47uF	10%	25V
C144	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C147	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C187	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C188	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C189	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C190	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C191	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C192	1-126-100-11	ELECT	10uF	20%	6.3V
C301	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C401	1-164-634-11	CERAMIC CHIP	1uF		16V
C402	1-164-634-11	CERAMIC CHIP	1uF		16V
C403	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C404	1-164-634-11	CERAMIC CHIP	1uF		16V
C406	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C407	1-164-634-11	CERAMIC CHIP	1uF		16V
C408	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C409	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C410	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C411	1-124-566-11	ELECT	120uF	20%	6.3V
C412	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C413	1-164-634-11	CERAMIC CHIP	1uF		16V
C414	1-162-920-11	CERAMIC CHIP	27PF	5%	50V
C415	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C416	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C417	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C419	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C501	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C503	1-164-634-11	CERAMIC CHIP	1uF		16V
C504	1-128-292-11	ELECT	220uF	20%	10V

Note 1) For replacement of CCD imager, CD-58 board, complete and DT-77 board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 95.

Ref. No.	Part No.	Description			Remark
C506	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C507	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C508	1-135-072-21	TANTALUM CHIP	0.22uF	10%	35V
C509	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C510	1-128-004-11	ELECT CHIP	10uF	20%	16V
C511	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C512	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C513	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C514	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C517	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C518	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C519	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C520	1-135-071-21	TANTALUM CHIP	0.15uF	10%	35V
C521	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C651	1-126-217-11	ELECT CHIP	15uF	20%	10V
C654	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C655	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C656	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C657	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C658	1-128-004-11	ELECT CHIP	10uF	20%	16V
C659	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C660	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C661	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C662	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C663	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C664	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C665	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C666	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C667	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C801	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C802	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C803	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C804	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C805	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C806	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C807	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C808	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C809	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C810	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C811	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C812	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C814	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C815	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C816	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C817	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C818	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C820	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C821	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C822	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C823	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C824	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C825	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C826	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C827	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C828	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C829	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C830	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C831	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C832	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C833	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C834	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C835	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C836	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C837	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C838	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C839	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C840	1-164-634-11	CERAMIC CHIP	1uF		16V
C841	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C842	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C843	1-164-634-11	CERAMIC CHIP	1uF		16V
C844	1-164-634-11	CERAMIC CHIP	1uF		16V
C845	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C846	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C847	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C848	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C849	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C850	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C852	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C853	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C854	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C855	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V

< CONNECTOR >

CN101	*	1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P
CN301		1-568-338-11	CONNECTOR, BOARD TO BOARD 24P
CN302		1-568-331-11	CONNECTOR, BOARD TO BOARD 10P
CN303		1-566-534-11	CONNECTOR, FPC (ZIF) 18P
CN304		1-565-877-11	PIN, CONNECTOR (PC BOARD) 5P
CN305		1-566-528-21	CONNECTOR, FPC (ZIF) 12P
CN306		1-565-528-21	PIN, CONNECTOR (PC BOARD) 3P
CN307	*	1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P
CN651	*	1-566-187-11	PIN, CONNECTOR (PC BOARD) 8P
CN652		1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P
CN653		1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P
CN654	*	1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P
CN655		1-565-530-11	PIN, CONNECTOR (PC BOARD) 5P
CN801	*	1-565-529-21	PIN, CONNECTOR (PC BOARD) 4P

Ref. No.	Part No.	Description	Remark
		< TRIMMER >	
CT122	1-141-356-11	CAP, ADJ	
		< DIODE >	
D101	8-719-404-46	DIODE MA110	
D102	8-719-404-52	DIODE MA143	
D122	8-719-404-32	DIODE MA141WA	
D123	8-719-404-46	DIODE MA110	
D124	8-719-404-32	DIODE MA141WA	
D126	8-719-404-46	DIODE MA110	
D128	8-719-404-46	DIODE MA110	
D501	8-719-404-46	DIODE MA110	
D502	8-719-404-46	DIODE MA110	
D503	8-719-404-46	DIODE MA110	
D504	8-719-404-46	DIODE MA110	
D600	8-719-420-90	DIODE MA8051-M	
D801	8-719-404-32	DIODE MA141WA	
D802	8-719-404-46	DIODE MA110	
D803	8-719-404-46	DIODE MA110	
D804	8-719-404-46	DIODE MA110	
		< FILTER >	
FL301	1-236-834-21	FILTER, LOW PASS	
FL302	1-415-751-21	DELAY LINE, LC (YH)	
FL303	1-415-819-11	DELAY LINE, LC	
FL401	1-415-775-21	DELAY LINE, LC	
		< HIC >	
HIC121	A-7068-174-A	HIC DT-77 BOARD, COMPLETE (Note 1)	
HIC301	A-7068-191-A	HIC MX-10 BOARD, COMPLETE	
		< IC >	
IC121	8-752-326-08	IC CXD1159Q	
IC301	8-759-946-00	IC MB88341PFV	
IC401	8-752-038-XX	IC CXA1392R	
IC501	8-759-038-86	IC MC68HC11E9FU-SC400225	
IC502	8-759-008-95	IC MC14028BF	
IC504	8-759-635-27	IC M62352GP	
IC505	8-759-998-96	IC LM324D	
IC507	8-759-234-77	IC TC4S66F	
IC508	8-759-937-56	IC S-8054ALB-LM-S	
IC509	8-759-509-05	IC XRU4066BF	
IC510	8-759-998-96	IC LM324D	
IC651	8-759-981-82	IC RC3414M	
IC652	8-759-037-20	IC MPC1737M	
IC653	8-759-998-98	IC LM358D	
IC656	8-759-998-96	IC LM324D	
IC801	8-759-946-00	IC MB88341PFV	
IC802	8-759-998-98	IC LM358DR	
IC803	8-759-100-93	IC uPC393G2	
IC804	8-759-509-29	IC XRU4011BF	
IC805	8-759-509-29	IC XRU4011BF	
IC806	8-759-926-98	IC SN74HC4040NS	
IC807	8-752-055-56	IC CXA1516Q	
IC808	8-759-998-96	IC LM324DR	
IC809	8-759-998-98	IC LM358DR	
		< COIL >	
L101	1-412-063-21	INDUCTOR CHIP 68uH	
L121	1-412-058-11	INDUCTOR CHIP 10uH	
L122	1-412-058-11	INDUCTOR CHIP 10uH	
L123	1-410-381-11	INDUCTOR CHIP 10uH	
L182	1-412-058-11	INDUCTOR CHIP 10uH	
L184	1-412-058-11	INDUCTOR CHIP 10uH	
L401	1-410-391-11	INDUCTOR CHIP 68uH	
L502	1-412-058-11	INDUCTOR CHIP 10uH	
L503	1-412-062-11	INDUCTOR CHIP 47uH	
L801	1-412-052-21	INDUCTOR CHIP 1uH	
L802	1-410-393-11	INDUCTOR CHIP 100uH	
L803	1-410-656-11	INDUCTOR CHIP 150uH	
L804	1-410-658-31	INDUCTOR CHIP 220uH	
L805	1-410-655-31	INDUCTOR CHIP 120uH	
L806	1-410-387-11	INDUCTOR CHIP 33uH	
		< TRANSISTOR >	
Q101	8-765-420-02	TRANSISTOR 2SK300-3	
Q102	8-729-905-35	TRANSISTOR 2SC4081-R	
Q121	8-729-402-84	TRANSISTOR XN4601	
Q122	8-729-402-78	TRANSISTOR XN6401	
Q123	8-729-402-19	TRANSISTOR XN6501	
Q125	8-729-905-35	TRANSISTOR 2SC4081-R	
Q126	8-729-402-84	TRANSISTOR XN4601	
Q129	8-729-905-23	TRANSISTOR 2SA1576-R	
Q131	8-729-402-84	TRANSISTOR XN4601	
Q132	8-729-402-84	TRANSISTOR XN4601	
Q133	8-729-402-84	TRANSISTOR XN4601	
Q135	8-729-402-84	TRANSISTOR XN4601	
Q136	8-729-402-45	TRANSISTOR UN5212	
Q301	8-729-905-23	TRANSISTOR 2SA1576-R	
Q302	8-729-905-23	TRANSISTOR 2SA1576-R	
Q303	8-729-402-84	TRANSISTOR XN4601	
Q402	8-729-402-84	TRANSISTOR XN4601	
Q403	8-729-905-23	TRANSISTOR 2SA1576-R	
Q404	8-729-905-35	TRANSISTOR 2SC4081-R	
Q502	8-729-420-50	TRANSISTOR UN5215	
Q504	8-729-403-10	TRANSISTOR XN6215	
Q505	8-729-403-10	TRANSISTOR XN6215	

Note 1) For replacement of CCD imager, CD-58 board, complete and DT-77 board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 95.

AF-85 **CD-58** **VC-94**

Ref. No.	Part No.	Description	Remark
Q506	8-729-420-07	TRANSISTOR XN6213	
Q507	8-729-420-50	TRANSISTOR UN5215	
Q508	8-729-402-78	TRANSISTOR XN6401	
Q509	8-729-403-10	TRANSISTOR XN6215	
Q510	8-729-905-35	TRANSISTOR 2SC4081-R	
Q513	8-729-402-84	TRANSISTOR XN4601	
Q514	8-729-905-35	TRANSISTOR 2SC4081-R	
Q515	8-729-402-84	TRANSISTOR XN4601	
Q516	8-729-905-35	TRANSISTOR 2SC4081-R	
Q651	8-729-905-23	TRANSISTOR 2SA1576-R	
Q653	8-729-106-60	TRANSISTOR 2SB1115A	
Q654	8-729-905-35	TRANSISTOR 2SC4081-R	
Q655	8-729-905-35	TRANSISTOR 2SC4081-R	
Q656	8-729-905-35	TRANSISTOR 2SC4081-R	
Q657	8-729-402-84	TRANSISTOR XN4601	
Q658	8-729-402-84	TRANSISTOR XN4601	
Q659	8-729-821-88	TRANSISTOR 2SK1332-3	
Q801	8-729-402-45	TRANSISTOR UN5212	
Q802	8-729-143-13	TRANSISTOR 2SC4176-B34	
Q803	8-729-905-35	TRANSISTOR 2SC4081-R	
Q804	8-729-905-23	TRANSISTOR 2SA1576-R	
Q805	8-729-143-13	TRANSISTOR 2SC4176-B34	
Q806	8-729-402-78	TRANSISTOR XN6401	
Q807	8-729-905-35	TRANSISTOR 2SC4081-R	
Q808	8-729-905-35	TRANSISTOR 2SC4081-R	
Q809	8-729-905-35	TRANSISTOR 2SC4081-R	
Q810	8-729-905-35	TRANSISTOR 2SC4081-R	
Q811	8-729-905-35	TRANSISTOR 2SC4081-R	
Q812	8-729-420-44	TRANSISTOR UN5210	
Q814	8-729-420-44	TRANSISTOR UN5210	
Q815	8-729-420-44	TRANSISTOR UN5210	
		< RESISTOR >	
R101	1-216-848-11	METAL CHIP 180K 5%	1/16W
R102	1-216-844-11	METAL CHIP 82K 5%	1/16W
R103	1-216-823-11	METAL CHIP 1.5K 5%	1/16W
R104	1-216-809-11	METAL CHIP 100 5%	1/16W
R105	1-216-827-11	METAL CHIP 3.3K 5%	1/16W
R108	1-216-864-11	METAL CHIP 0	
R110	1-216-839-11	METAL CHIP 33K 5%	1/16W
R111	1-216-839-11	METAL CHIP 33K 5%	1/16W
R112	1-216-821-11	METAL CHIP 1K 5%	1/16W
R114	1-216-845-11	METAL CHIP 100K 5%	1/16W
R115	1-216-821-11	METAL CHIP 1K 5%	1/16W
R116	1-216-821-11	METAL CHIP 1K 5%	1/16W
R117	1-216-825-11	METAL CHIP 2.2K 5%	1/16W
R118	1-216-813-11	METAL CHIP 220 5%	1/16W
R119	1-216-821-11	METAL CHIP 1K 5%	1/16W
R122	1-216-857-11	METAL CHIP 1M 5%	1/16W
R124	1-216-839-11	METAL CHIP 33K 5%	1/16W
R125	1-216-845-11	METAL CHIP 100K 5%	1/16W
R126	1-216-837-11	METAL CHIP 22K 5%	1/16W
R127	1-216-820-11	METAL CHIP 820 5%	1/16W
R128	1-216-843-11	METAL CHIP 68K 5%	1/16W
R129	1-216-833-11	METAL CHIP 10K 5%	1/16W
R130	1-216-835-11	METAL CHIP 15K 5%	1/16W
R131	1-216-844-11	METAL CHIP 82K 5%	1/16W
R132	1-216-844-11	METAL CHIP 82K 5%	1/16W
R133	1-216-850-11	METAL CHIP 270K 5%	1/16W
R136	1-216-831-11	METAL CHIP 6.8K 5%	1/16W
R138	1-216-835-11	METAL CHIP 15K 5%	1/16W
R139	1-216-837-11	METAL CHIP 22K 5%	1/16W
R140	1-216-837-11	METAL CHIP 22K 5%	1/16W
R141	1-216-841-11	METAL CHIP 47K 5%	1/16W
R142	1-216-837-11	METAL CHIP 22K 5%	1/16W
R143	1-216-845-11	METAL CHIP 100K 5%	1/16W
R148	1-216-848-11	METAL CHIP 180K 5%	1/16W
R149	1-216-821-11	METAL CHIP 1K 5%	1/16W
R153	1-216-864-11	METAL CHIP 0	
R156	1-216-864-11	METAL CHIP 0	
R165	1-216-837-11	METAL CHIP 22K 5%	1/16W
R166	1-216-836-11	METAL CHIP 18K 5%	1/16W
R167	1-216-822-11	METAL CHIP 1.2K 5%	1/16W
R168	1-216-821-11	METAL CHIP 1K 5%	1/16W
R170	1-216-833-11	METAL CHIP 10K 5%	1/16W
R171	1-216-821-11	METAL CHIP 1K 5%	1/16W
R173	1-216-813-11	METAL CHIP 220 5%	1/16W
R181	1-216-821-11	METAL CHIP 1K 5%	1/16W
R182	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R183	1-216-821-11	METAL CHIP 1K 5%	1/16W
R184	1-216-835-11	METAL CHIP 15K 5%	1/16W
R186	1-216-821-11	METAL CHIP 1K 5%	1/16W
R187	1-216-821-11	METAL CHIP 1K 5%	1/16W
R188	1-216-821-11	METAL CHIP 1K 5%	1/16W
R189	1-216-821-11	METAL CHIP 1K 5%	1/16W
R190	1-216-821-11	METAL CHIP 1K 5%	1/16W
R191	1-216-821-11	METAL CHIP 1K 5%	1/16W
R192	1-216-821-11	METAL CHIP 1K 5%	1/16W
R193	1-216-821-11	METAL CHIP 1K 5%	1/16W
R194	1-216-821-11	METAL CHIP 1K 5%	1/16W
R195	1-216-821-11	METAL CHIP 1K 5%	1/16W
R196	1-216-813-11	METAL CHIP 220 5%	1/16W
R197	1-216-821-11	METAL CHIP 1K 5%	1/16W
R198	1-216-821-11	METAL CHIP 1K 5%	1/16W
R199	1-216-821-11	METAL CHIP 1K 5%	1/16W
R200	1-216-844-11	METAL CHIP 82K 5%	1/16W
R201	1-216-671-11	METAL CHIP 6.8K 0.5%	1/10W
R202	1-216-643-11	METAL CHIP 470 0.5%	1/10W

Ref. No.	Part No.	Description			Remark
R203	1-216-681-11	METAL CHIP	18K	0.5%	1/10W
R204	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R205	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W
R206	1-216-681-11	METAL CHIP	18K	0.5%	1/10W
R207	1-216-841-11	METAL CHIP	47K	5%	1/16W
R208	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R209	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R210	1-216-833-11	METAL CHIP	10K	5%	1/16W
R215	1-216-842-11	METAL CHIP	56K	5%	1/16W
R216	1-216-833-11	METAL CHIP	10K	5%	1/16W
R217	1-216-833-11	METAL CHIP	10K	5%	1/16W
R218	1-216-833-11	METAL CHIP	10K	5%	1/16W
R219	1-216-833-11	METAL CHIP	10K	5%	1/16W
R220	1-216-835-11	METAL CHIP	15K	5%	1/16W
R221	1-216-840-11	METAL CHIP	39K	5%	1/16W
R222	1-216-833-11	METAL CHIP	10K	5%	1/16W
R229	1-216-864-11	METAL CHIP	0		
R230	1-216-833-11	METAL CHIP	10K	5%	1/16W
R231	1-216-813-11	METAL CHIP	220	5%	1/16W
R232	1-216-813-11	METAL CHIP	220	5%	1/16W
R233	1-216-838-11	METAL CHIP	27K	5%	1/16W
R234	1-216-841-11	METAL CHIP	47K	5%	1/16W
R237	1-216-296-00	METAL CHIP	0		
R301	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R302	1-216-821-11	METAL CHIP	1K	5%	1/16W
R303	1-216-864-11	METAL CHIP	0		
R304	1-216-821-11	METAL CHIP	1K	5%	1/16W
R307	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R311	1-216-821-11	METAL CHIP	1K	5%	1/16W
R312	1-216-836-11	METAL CHIP	18K	5%	1/16W
R313	1-216-837-11	METAL CHIP	22K	5%	1/16W
R314	1-216-839-11	METAL CHIP	33K	5%	1/16W
R315	1-216-838-11	METAL CHIP	27K	5%	1/16W
R316	1-216-842-11	METAL CHIP	56K	5%	1/16W
R317	1-216-837-11	METAL CHIP	22K	5%	1/16W
R318	1-216-833-11	METAL CHIP	10K	5%	1/16W
R321	1-216-833-11	METAL CHIP	10K	5%	1/16W
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R325	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R328	1-216-864-11	METAL CHIP	0		
R329	1-216-864-11	METAL CHIP	0		
R402	1-216-833-11	METAL CHIP	10K	5%	1/16W
R406	1-216-864-11	METAL CHIP	0		
R407	1-216-821-11	METAL CHIP	1K	5%	1/16W
R408	1-216-864-11	METAL CHIP	0		
R409	1-216-864-11	METAL CHIP	0		
R411	1-216-864-11	METAL CHIP	0		
R414	1-216-864-11	METAL CHIP	0		
R415	1-216-820-11	METAL CHIP	820	5%	1/16W
R416	1-216-815-11	METAL CHIP	330	5%	1/16W
R417	1-216-833-11	METAL CHIP	10K	5%	1/16W
R418	1-216-833-11	METAL CHIP	10K	5%	1/16W
R419	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R420	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R421	1-216-821-11	METAL CHIP	1K	5%	1/16W
R427	1-216-841-11	METAL CHIP	47K	5%	1/16W
R428	1-216-835-11	METAL CHIP	15K	5%	1/16W
R429	1-216-839-11	METAL CHIP	33K	5%	1/16W
R432	1-216-839-11	METAL CHIP	33K	5%	1/16W
R437	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R440	1-216-864-11	METAL CHIP	0		
R501	1-216-837-11	METAL CHIP	22K	5%	1/16W
R502	1-216-837-11	METAL CHIP	22K	5%	1/16W
R503	1-216-833-11	METAL CHIP	10K	5%	1/16W
R504	1-216-833-11	METAL CHIP	10K	5%	1/16W
R505	1-216-841-11	METAL CHIP	47K	5%	1/16W
R508	1-216-833-11	METAL CHIP	10K	5%	1/16W
R509	1-216-833-11	METAL CHIP	10K	5%	1/16W
R510	1-216-833-11	METAL CHIP	10K	5%	1/16W
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W
R513	1-216-845-11	METAL CHIP	100K	5%	1/16W
R514	1-216-833-11	METAL CHIP	10K	5%	1/16W
R515	1-216-857-11	METAL CHIP	1M	5%	1/16W
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W
R518	1-216-833-11	METAL CHIP	10K	5%	1/16W
R519	1-216-833-11	METAL CHIP	10K	5%	1/16W
R521	1-216-833-11	METAL CHIP	10K	5%	1/16W
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W
R523	1-216-840-11	METAL CHIP	39K	5%	1/16W
R524	1-216-833-11	METAL CHIP	10K	5%	1/16W
R525	1-216-833-11	METAL CHIP	10K	5%	1/16W
R526	1-216-847-11	METAL CHIP	150K	5%	1/16W
R527	1-216-845-11	METAL CHIP	100K	5%	1/16W
R528	1-216-833-11	METAL CHIP	10K	5%	1/16W
R529	1-216-845-11	METAL CHIP	100K	5%	1/16W
R530	1-216-845-11	METAL CHIP	100K	5%	1/16W
R531	1-216-833-11	METAL CHIP	10K	5%	1/16W
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W
R533	1-216-833-11	METAL CHIP	10K	5%	1/16W
R534	1-216-837-11	METAL CHIP	22K	5%	1/16W
R535	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R536	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W
R546	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R547	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R550	1-216-833-11	METAL CHIP	10K	5%	1/16W
R551	1-216-833-11	METAL CHIP	10K	5%	1/16W

Ref.No.	Part No.	Description			Remark
R552	1-216-833-11	METAL CHIP	10K	5%	1/16W
R553	1-216-685-11	METAL CHIP	27K	0. 5%	1/10W
R554	1-216-841-11	METAL CHIP	47K	5%	1/16W
R555	1-216-691-11	METAL CHIP	47K	0. 5%	1/10W
R556	1-216-833-11	METAL CHIP	10K	5%	1/16W
R557	1-216-844-11	METAL CHIP	82K	5%	1/16W
R560	1-216-833-11	METAL CHIP	10K	5%	1/16W
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W
R645	1-216-839-11	METAL CHIP	33K	5%	1/16W
R646	1-216-841-11	METAL CHIP	47K	5%	1/16W
R647	1-216-832-11	METAL CHIP	8. 2K	5%	1/16W
R648	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W
R649	1-216-309-00	METAL CHIP	5. 6	5%	1/10W
R650	1-216-833-11	METAL CHIP	10K	5%	1/16W
R652	1-216-835-11	METAL CHIP	15K	5%	1/16W
R653	1-216-835-11	METAL CHIP	15K	5%	1/16W
R654	1-216-843-11	METAL CHIP	68K	5%	1/16W
R655	1-216-834-11	METAL CHIP	12K	5%	1/16W
R656	1-216-134-00	METAL CHIP	2. 2	5%	1/8W
R659	1-216-821-11	METAL CHIP	1K	5%	1/16W
R660	1-216-836-11	METAL CHIP	18K	5%	1/16W
R661	1-216-821-11	METAL CHIP	1K	5%	1/16W
R662	1-216-815-11	METAL CHIP	330	5%	1/16W
R664	1-216-821-11	METAL CHIP	1K	5%	1/16W
R665	1-216-821-11	METAL CHIP	1K	5%	1/16W
R666	1-216-839-11	METAL CHIP	33K	5%	1/16W
R667	1-216-839-11	METAL CHIP	33K	5%	1/16W
R668	1-216-833-11	METAL CHIP	10K	5%	1/16W
R669	1-216-841-11	METAL CHIP	47K	5%	1/16W
R670	1-216-807-11	METAL CHIP	68	5%	1/16W
R671	1-216-848-11	METAL CHIP	180K	5%	1/16W
R672	1-216-848-11	METAL CHIP	180K	5%	1/16W
R673	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W
R674	1-216-840-11	METAL CHIP	39K	5%	1/16W
R675	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W
R676	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W
R677	1-216-844-11	METAL CHIP	82K	5%	1/16W
R679	1-216-837-11	METAL CHIP	22K	5%	1/16W
R680	1-216-833-11	METAL CHIP	10K	5%	1/16W
R681	1-216-817-11	METAL CHIP	470	5%	1/16W
R682	1-216-833-11	METAL CHIP	10K	5%	1/16W
R683	1-216-857-11	METAL CHIP	1M	5%	1/16W
R684	1-216-823-11	METAL CHIP	1. 5K	5%	1/16W
R685	1-216-848-11	METAL CHIP	180K	5%	1/16W
R686	1-216-830-11	METAL CHIP	5. 6K	5%	1/16W
R687	1-216-833-11	METAL CHIP	10K	5%	1/16W
R688	1-216-841-11	METAL CHIP	47K	5%	1/16W
R689	1-216-843-11	METAL CHIP	68K	5%	1/16W
R690	1-216-839-11	METAL CHIP	33K	5%	1/16W

Ref.No.	Part No.	Description			Remark
R694	1-216-848-11	METAL CHIP	180K	5%	1/16W
R698	1-216-837-11	METAL CHIP	22K	5%	1/16W
R699	1-216-827-11	METAL CHIP	3. 3K	5%	1/16W
R700	1-216-855-11	METAL CHIP	680K	5%	1/16W
R702	1-216-681-11	METAL CHIP	18K	0. 5%	1/10W
R703	1-216-677-11	METAL CHIP	12K	0. 5%	1/10W
R801	1-216-833-11	METAL CHIP	10K	5%	1/16W
R802	1-218-298-11	METAL CHIP	2. 2K	0. 50%	1/16W
R803	1-218-313-11	METAL CHIP	560	0. 50%	1/16W
R804	1-216-629-11	METAL CHIP	120	0. 5%	1/10W
R805	1-216-651-11	METAL CHIP	1K	0. 5%	1/10W
R806	1-218-298-11	METAL CHIP	2. 2K	0. 50%	1/16W
R807	1-216-820-11	METAL CHIP	820	5%	1/16W
R808	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R809	1-216-134-00	METAL CHIP	2. 2	5%	1/8W
R810	1-216-835-11	METAL CHIP	15K	5%	1/16W
R811	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R812	1-216-853-11	METAL CHIP	470K	5%	1/16W
R813	1-216-821-11	METAL CHIP	1K	5%	1/16W
R814	1-216-832-11	METAL CHIP	8. 2K	5%	1/16W
R815	1-216-835-11	METAL CHIP	15K	5%	1/16W
R816	1-216-821-11	METAL CHIP	1K	5%	1/16W
R817	1-216-832-11	METAL CHIP	8. 2K	5%	1/16W
R818	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R819	1-216-853-11	METAL CHIP	470K	5%	1/16W
R820	1-216-832-11	METAL CHIP	8. 2K	5%	1/16W
R821	1-216-679-11	METAL CHIP	15K	0. 5%	1/10W
R822	1-216-675-11	METAL CHIP	10K	0. 5%	1/10W
R825	1-216-679-11	METAL CHIP	15K	0. 5%	1/10W
R826	1-216-675-11	METAL CHIP	10K	0. 5%	1/10W
R827	1-216-675-11	METAL CHIP	10K	0. 5%	1/10W
R828	1-216-809-11	METAL CHIP	100	5%	1/16W
R829	1-216-687-11	METAL CHIP	33K	0. 5%	1/10W
R830	1-216-683-11	METAL CHIP	22K	0. 5%	1/10W
R831	1-216-811-11	METAL CHIP	150	5%	1/16W
R832	1-216-821-11	METAL CHIP	1K	5%	1/16W
R833	1-216-817-11	METAL CHIP	470	5%	1/16W
R834	1-216-839-11	METAL CHIP	33K	5%	1/16W
R835	1-216-836-11	METAL CHIP	18K	5%	1/16W
R836	1-216-833-11	METAL CHIP	10K	5%	1/16W
R837	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W
R838	1-216-809-11	METAL CHIP	100	5%	1/16W
R839	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R840	1-216-821-11	METAL CHIP	1K	5%	1/16W
R841	1-216-833-11	METAL CHIP	10K	5%	1/16W
R842	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W
R843	1-216-821-11	METAL CHIP	1K	5%	1/16W
R844	1-216-822-11	METAL CHIP	1. 2K	5%	1/16W
R845	1-216-817-11	METAL CHIP	470	5%	1/16W

Ref. No.	Part No.	Description			Remark
R846	1-216-839-11	METAL CHIP	33K	5%	1/16W
R847	1-216-838-11	METAL CHIP	27K	5%	1/16W
R848	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R849	1-216-821-11	METAL CHIP	1K	5%	1/16W
R850	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R851	1-216-857-11	METAL CHIP	1M	5%	1/16W
R852	1-216-857-11	METAL CHIP	1M	5%	1/16W
R853	1-216-857-11	METAL CHIP	1M	5%	1/16W
R854	1-216-817-11	METAL CHIP	470	5%	1/16W
R855	1-216-838-11	METAL CHIP	27K	5%	1/16W
R856	1-216-846-11	METAL CHIP	120K	5%	1/16W
R857	1-216-839-11	METAL CHIP	33K	5%	1/16W
R858	1-216-838-11	METAL CHIP	27K	5%	1/16W
R859	1-216-838-11	METAL CHIP	27K	5%	1/16W
R860	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R863	1-216-817-11	METAL CHIP	470	5%	1/16W
R864	1-216-846-11	METAL CHIP	120K	5%	1/16W
R865	1-216-839-11	METAL CHIP	33K	5%	1/16W
R866	1-216-846-11	METAL CHIP	120K	5%	1/16W
R867	1-216-839-11	METAL CHIP	33K	5%	1/16W
R871	1-216-817-11	METAL CHIP	470	5%	1/16W
R872	1-216-821-11	METAL CHIP	1K	5%	1/16W
R873	1-216-834-11	METAL CHIP	12K	5%	1/16W
R874	1-216-834-11	METAL CHIP	12K	5%	1/16W
R875	1-216-834-11	METAL CHIP	12K	5%	1/16W

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description
W102	1-633-975-11	FP-268 FLEXIBLE BOARD
W801	1-638-477-11	FLEXIBLE BOARD

< CRYSTAL >

Ref. No.	Part No.	Description
X121	1-579-042-11	VIBRATOR, CRYSTAL (28.6363MHz)
X501	1-578-689-21	VIBRATOR (8MHz)

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* 1-638-470-11 CC-61 BOARD (Ref.No 3,000 Series)
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< CONNECTOR >

Ref. No.	Part No.	Description
CN511	1-569-363-21	CONNECTOR, FPC 15P
CN512	1-566-529-11	CONNECTOR, FPC (ZIF) 13P
CN513	1-566-527-11	CONNECTOR, FPC (ZIF) 11P

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* A-7062-636-A CT-38 BOARD, COMPLETE
(Ref.No 2,000 Series)

* A-7062-612-A VA-67 BOARD, COMPLETE
****
(Ref.No 2,000 Series)

Ref. No.	Part No.	Description
	1-537-142-21	TERMINAL BOARD
	1-579-240-11	VIBRATOR, CRYSTAL
	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD
	3-744-842-01	SUPPORT, CT PC BOARD

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C071	1-128-004-11	ELECT CHIP	10uF	20%	16V
C072	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C101	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C102	1-128-004-11	ELECT CHIP	10uF	20%	16V
C103	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C104	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C105	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C110	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C111	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C112	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C113	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C116	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C117	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C121	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C122	1-128-004-11	ELECT CHIP	10uF	20%	16V
C126	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C127	1-164-461-11	CERAMIC CHIP	91PF	5%	50V
C129	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C141	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C143	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C144	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C146	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C147	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C171	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C172	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C181	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C183	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C202	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V
C209	1-126-154-11	ELECT	47uF	20%	6.3V
C210	1-128-008-11	ELECT CHIP	3.3uF	20%	35V

Ref. No.	Part No.	Description			Remark
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V
C212	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C213	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C214	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V
C216	1-126-607-11	ELECT CHIP	47uF	20%	4V
C217	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C218	1-126-209-11	ELECT CHIP	100uF	20%	4V
C219	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C220	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C221	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C222	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C224	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C225	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C226	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C227	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C228	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C229	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C230	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C231	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C232	1-162-638-11	CERAMIC CHIP	1uF		16V
C233	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C235	1-128-004-11	ELECT CHIP	10uF	20%	16V
C236	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C237	1-128-004-11	ELECT CHIP	10uF	20%	16V
C238	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C239	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V
C241	1-128-004-11	ELECT CHIP	10uF	20%	16V
C242	1-128-003-11	ELECT CHIP	22uF	20%	4V
C245	1-164-160-11	CERAMIC CHIP	20PF	10%	50V
C246	1-128-003-11	ELECT CHIP	22uF	20%	4V
C247	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C248	1-128-004-11	ELECT CHIP	10uF	20%	16V
C249	1-128-004-11	ELECT CHIP	10uF	20%	16V
C250	1-128-004-11	ELECT CHIP	10uF	20%	16V
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V
C252	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C253	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C254	1-128-004-11	ELECT CHIP	10uF	20%	16V
C255	1-128-013-11	ELECT CHIP	1uF	20%	50V
C256	1-126-246-11	ELECT CHIP	220uF	20%	4V
C257	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C258	1-128-004-11	ELECT CHIP	10uF	20%	16V
C259	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C262	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C263	1-126-207-11	ELECT CHIP	33uF	20%	4V
C264	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C265	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C267	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C268	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C269	1-128-003-11	ELECT CHIP	22uF	20%	4V
C270	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C271	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C273	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C274	1-128-004-11	ELECT CHIP	10uF	20%	16V
C275	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C276	1-128-004-11	ELECT CHIP	10uF	20%	16V
C277	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C278	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C281	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C285	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C286	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C287	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C288	1-126-176-11	ELECT	220uF	20%	10V
C289	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C301	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C302	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C303	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C305	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C306	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C307	1-128-004-11	ELECT CHIP	10uF	20%	16V
C308	1-162-995-11	CERAMIC CHIP	0.022uF		50V
C309	1-135-176-21	TANTALUM CHIP	0.68uF	10%	20V
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V
C311	1-128-013-11	ELECT CHIP	1uF	20%	50V
C312	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C313	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C314	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C315	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C316	1-128-004-11	ELECT CHIP	10uF	20%	16V
C317	1-128-004-11	ELECT CHIP	10uF	20%	16V
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C319	1-164-217-11	CERAMIC CHIP	150PF	0.25PF	50V
C320	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C321	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C322	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C323	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C324	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C325	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C326	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C327	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C328	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C329	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C330	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C331	1-128-004-11	ELECT CHIP	10uF	20%	16V
C332	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C333	1-162-950-11	CERAMIC CHIP	56PF	5%	50V

Ref. No.	Part No.	Description			Remark
C334	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V
C335	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C336	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C337	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C338	1-162-995-11	CERAMIC CHIP	0. 022uF		50V
C339	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C340	1-162-937-11	CERAMIC CHIP	6PF	0. 5PF	50V
C400	1-162-971-11	CERAMIC CHIP	0. 001uF		50V
C402	1-162-971-11	CERAMIC CHIP	0. 001uF		50V
C403	1-162-971-11	CERAMIC CHIP	0. 001uF		50V
C405	1-162-971-11	CERAMIC CHIP	0. 001uF		50V
C406	1-164-489-11	CERAMIC CHIP	0. 22uF	10%	16V
C407	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V
C408	1-124-779-00	ELECT CHIP	10uF	20%	16v
C409	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V
C410	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C411	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V
C412	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C413	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C414	1-126-206-11	ELECT CHIP	100uF	20%	6. 3V
C416	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C417	1-163-989-11	CERAMIC CHIP	0. 033uF	10%	25V
C418	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C419	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V
C421	1-162-965-11	CERAMIC CHIP	0. 0015uF	10%	50V
C422	1-162-638-11	CERAMIC CHIP	1uF		16V
C423	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C424	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C427	1-162-969-11	CERAMIC CHIP	0. 0068uF	10%	25V
C428	1-162-977-11	CERAMIC CHIP	0. 0018uF	10%	50V
C429	1-128-013-11	ELECT CHIP	1uF	20%	50V
C430	1-126-607-11	ELECT CHIP	47uF	20%	4V
C431	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V
C432	1-128-003-11	ELECT CHIP	22uF	20%	4V
C434	1-128-004-11	ELECT CHIP	10uF	20%	16V
C435	1-128-013-11	ELECT CHIP	1uF	20%	50V
C436	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V
C437	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C439	1-128-013-11	ELECT CHIP	1uF	20%	50V
C441	1-162-637-11	CERAMIC CHIP	0. 47uF		16V
C469	1-162-966-11	CERAMIC CHIP	0. 0022uF	10%	50V
C615	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C620	1-162-971-11	CERAMIC CHIP	0. 001uF		50V
C700	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C702	1-128-020-11	ELECT CHIP	10uF	0	6. 3V
C704	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C705	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C706	1-162-638-11	CERAMIC CHIP	1uF		16V
C708	1-162-915-11	CERAMIC CHIP	10PF	0. 5PF	50V

Ref. No.	Part No.	Description			Remark
C710	1-128-020-11	ELECT CHIP	10uF	0	6. 3V
C711	1-164-232-11	CERAMIC CHIP	0. 01uF		50V
C717	1-128-015-11	ELECT CHIP	22uF	0	4V
C718	1-128-015-11	ELECT CHIP	22uF	0	4V
C720	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C723	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C724	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C726	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C727	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C728	1-128-020-11	ELECT CHIP	10uF	0	6. 3V
C729	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C730	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C734	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C735	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C736	1-162-638-11	CERAMIC CHIP	1uF		16V
C737	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C738	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C739	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C740	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C741	1-162-918-11	CERAMIC CHIP	18PF	5%	50V
C742	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C743	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C744	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C745	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C746	1-164-227-11	CERAMIC CHIP	0. 022uF	10%	25V
C747	1-164-227-11	CERAMIC CHIP	0. 022uF	10%	25V
C748	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C749	1-135-145-11	TANTALUM CHIP	0. 47uF	10%	25V
C751	1-135-179-21	TANTAL. CHIP	2. 2uF	20%	16V
C752	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C753	1-162-915-11	CERAMIC CHIP	10PF	0. 5PF	50V
C754	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C755	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C756	1-162-638-11	CERAMIC CHIP	1uF		16V
C757	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C758	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C759	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C760	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C761	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C763	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C769	1-128-049-11	ELECT CHIP	1uF	0	50V
C773	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V
C774	1-162-965-11	CERAMIC CHIP	0. 0015uF	10%	50V
C799	1-135-178-11	TANTAL. CHIP	1. 5uF	20%	20V
C901	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C902	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C903	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C904	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C905	1-162-997-11	CERAMIC CHIP	10PF	0. 5PF	50V

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Ref. No.	Part No.	Description	Remark
C906	1-163-123-00	CERAMIC CHIP 180PF 5% 50V	
C907	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C908	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C909	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C910	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C911	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C930	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C931	1-162-638-11	CERAMIC CHIP 1uF 16V	
		< FILTER >	
CF301	1-567-727-11	FILTER, CERAMIC	
		< CONNECTOR >	
CN401	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P	
CN506	1-569-486-11	CONNECTOR, BOARD TO BOARD 16P	
CN507	1-569-485-11	CONNECTOR, BOARD TO BOARD 20P	
CN508	1-569-478-21	CONNECTOR, FPC 20P	
CN601	* 1-566-764-11	PIN, CONNECTOR (PC BOARD) 9P	
CN703	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P	
CN704	1-569-363-21	CONNECTOR, FPC 15P	
CN705	1-568-336-11	CONNECTOR, BOARD TO BOARD 20P	
CN901	1-566-524-21	CONNECTOR, FPC (ZIF) 8P	
		< TRIMMER >	
CT701	1-141-331-11	CAP, CHIP TRIMMER	
CT702	1-141-331-11	CAP, CHIP TRIMMER	
CT901	1-141-331-11	CAP, CHIP TRIMMER	
CT902	1-141-417-11	CAP, ADJ	
		< DIODE >	
D101	8-719-800-76	DIODE 1SS226	
D202	8-719-941-86	DIODE DAN202U	
D203	8-719-941-86	DIODE DAN202U	
D204	8-719-404-46	DIODE MA110	
D205	8-719-941-86	DIODE DAN202U	
D207	8-719-941-86	DIODE DAN202U	
D212	8-719-941-86	DIODE DAN202U	
D215	8-719-404-46	DIODE MA110	
D216	8-719-404-46	DIODE MA110	
D217	8-719-801-41	DIODE 1SS196	
D901	8-719-949-46	DIODE 1T32	
D903	8-719-404-46	DIODE MA110	
D904	8-719-404-46	DIODE MA110	
D905	8-719-404-46	DIODE MA110	
D906	8-719-404-46	DIODE MA110	

Ref. No.	Part No.	Description	Remark
		< FILTER >	
FL201	1-236-751-21	FILTER, LOW PASS	
FL203	1-236-757-21	FILTER, LOW PASS (C)	
FL204	1-415-818-11	DELAY LINE, LC (Y)	
FL301	1-236-575-11	B.P.F	
FL302	1-236-146-11	FILTER, BAND PASS	
		< IC >	
IC001	8-759-999-02	IC TL1596CDB	
IC201	8-752-036-19	IC CXA1207R	
IC202	8-752-332-68	IC CXL5502M	
IC203	8-752-036-20	IC CXA1208R	
IC205	8-759-710-29	IC NJM2235M	
IC206	8-759-320-76	IC HA118070FP	
IC207	8-759-710-07	IC NJM2234M	
IC400	8-759-823-19	IC CXA-1488R	
IC701	8-759-998-30	IC CF79028PG	
IC702	8-759-979-96	IC MB8464A-15LLPF	
IC703	8-752-039-49	IC CXA1393AN	
IC704	8-759-634-47	IC M51285BGP	
IC707	8-759-710-29	IC NJM2235M	
IC708	8-759-710-09	IC NJM2233AM	
IC709	8-759-710-09	IC NJM2233AM	
IC713	8-759-234-20	IC TC7S08F	
IC901	8-759-970-80	IC MB673198U	
IC902	8-759-153-41	IC uPD6451AGT-611-E1	
		< COIL >	
L101	1-412-032-11	INDUCTOR CHIP 100uH	
L102	1-412-280-31	INDUCTOR 330uH	
L103	1-410-167-41	INDUCTOR CHIP 820uH	
L105	1-410-657-21	INDUCTOR CHIP 180uH	
L106	1-410-387-11	INDUCTOR CHIP 33uH	
L109	1-410-381-11	INDUCTOR CHIP 10uH	
L110	1-410-657-21	INDUCTOR CHIP 180uH	
L123	1-410-655-31	INDUCTOR CHIP 120uH	
L124	1-412-280-31	INDUCTOR 330uH	
L125	1-410-380-31	INDUCTOR CHIP 8.2uH	
L126	1-412-032-11	INDUCTOR CHIP 100uH	
L171	1-410-392-11	INDUCTOR CHIP 82uH	
L201	1-410-390-11	INDUCTOR CHIP 56uH	
L202	1-410-392-11	INDUCTOR CHIP 82uH	
L203	1-410-370-31	INDUCTOR CHIP 1.2uH	
L204	1-410-656-11	INDUCTOR CHIP 150uH	
L208	1-410-390-11	INDUCTOR CHIP 56uH	
L209	1-412-031-11	INDUCTOR CHIP 47uH	
L210	1-410-393-11	INDUCTOR CHIP 100uH	

Ref. No.	Part No.	Description	Remark
L211	1-410-375-11	INDUCTOR CHIP 3.3uH	
L213	1-410-390-11	INDUCTOR CHIP 56uH	
L214	1-410-377-31	INDUCTOR CHIP 4.7uH	
L301	1-410-393-11	INDUCTOR CHIP 100uH	
L302	1-410-385-11	INDUCTOR CHIP 22uH	
L303	1-410-385-11	INDUCTOR CHIP 22uH	
L304	1-410-393-11	INDUCTOR CHIP 100uH	
L305	1-410-393-11	INDUCTOR CHIP 100uH	
L306	1-410-655-31	INDUCTOR CHIP 120uH	
L307	1-410-656-11	INDUCTOR CHIP 150uH	
L308	1-410-377-31	INDUCTOR CHIP 4.7uH	
L400	1-410-384-31	INDUCTOR CHIP 18uH	
L700	1-412-028-11	INDUCTOR CHIP 4.7uH	
L701	1-410-384-31	INDUCTOR CHIP 18uH	
L702	1-412-028-11	INDUCTOR CHIP 4.7uH	
L703	1-412-028-11	INDUCTOR CHIP 4.7uH	
L704	1-412-032-11	INDUCTOR CHIP 100uH	
L902	1-412-143-11	INDUCTOR 39uH	
L903	1-412-282-41	INDUCTOR 470uH	
		< TRANSISTOR >	
Q004	8-729-905-35	TRANSISTOR 2SC4081-R	
Q005	8-729-905-35	TRANSISTOR 2SC4081-R	
Q059	8-729-905-18	TRANSISTOR DTC144EU	
Q101	8-729-905-23	TRANSISTOR 2SA1576-R	
Q102	8-729-905-18	TRANSISTOR DTC144EU	
Q105	8-729-905-35	TRANSISTOR 2SC4081-R	
Q106	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q107	8-729-905-12	TRANSISTOR DTA144EU	
Q109	8-729-905-35	TRANSISTOR 2SC4081-R	
Q110	8-729-905-12	TRANSISTOR DTA144EU	
Q116	8-729-905-18	TRANSISTOR DTC144EU	
Q119	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q121	8-729-905-23	TRANSISTOR 2SA1576-R	
Q122	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q123	8-729-905-35	TRANSISTOR 2SC4081-R	
Q140	8-729-905-12	TRANSISTOR DTA144EU	
Q141	8-729-905-35	TRANSISTOR 2SC4081-R	
Q142	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q171	8-729-905-35	TRANSISTOR 2SC4081-R	
Q172	8-729-905-35	TRANSISTOR 2SC4081-R	
Q191	8-729-905-35	TRANSISTOR 2SC4081-R	
Q192	8-729-905-18	TRANSISTOR DTC144EU	
Q201	8-729-905-35	TRANSISTOR 2SC4081-R	
Q202	8-729-905-12	TRANSISTOR DTA144EU	
Q203	8-729-905-23	TRANSISTOR 2SA1576-R	
Q204	8-729-905-35	TRANSISTOR 2SC4081-R	
Q205	8-729-100-66	TRANSISTOR 2SC1623	
Q206	8-729-905-35	TRANSISTOR 2SC4081-R	
Q209	8-729-905-18	TRANSISTOR DTC144EU	
Q210	8-729-905-23	TRANSISTOR 2SA1576-R	
Q211	8-729-905-35	TRANSISTOR 2SC4081-R	
Q212	8-729-905-35	TRANSISTOR 2SC4081-R	
Q213	8-729-904-07	TRANSISTOR FMG2	
Q215	8-729-905-23	TRANSISTOR 2SA1576-R	
Q216	8-729-905-18	TRANSISTOR DTC144EU	
Q220	8-729-141-48	TRANSISTOR 2SB624T1-BV345	
Q221	8-729-905-18	TRANSISTOR DTC144EU	
Q222	8-729-905-12	TRANSISTOR DTA144EU	
Q223	8-729-905-35	TRANSISTOR 2SC4081-R	
Q224	8-729-905-35	TRANSISTOR 2SC4081-R	
Q225	8-729-905-12	TRANSISTOR DTA144EU	
Q226	8-729-905-35	TRANSISTOR 2SC4081-R	
Q227	8-729-905-35	TRANSISTOR 2SC4081-R	
Q228	8-729-905-23	TRANSISTOR 2SA1576-R	
Q229	8-729-905-35	TRANSISTOR 2SC4081-R	
Q231	8-729-905-35	TRANSISTOR 2SC4081-R	
Q232	8-729-905-35	TRANSISTOR 2SC4081-R	
Q238	8-729-905-23	TRANSISTOR 2SA1576-R	
Q240	8-729-905-35	TRANSISTOR 2SC4081-R	
Q241	8-729-905-23	TRANSISTOR 2SA1576-R	
Q244	8-729-905-18	TRANSISTOR DTC144EU	
Q245	8-729-905-XX	TRANSISTOR DTC114TU	
Q246	8-729-905-XX	TRANSISTOR DTC114TU	
Q247	8-729-905-XX	TRANSISTOR DTC114TU	
Q248	8-729-905-18	TRANSISTOR DTC144EU	
Q250	8-729-905-35	TRANSISTOR 2SC4081-R	
Q301	8-729-905-23	TRANSISTOR 2SA1576-R	
Q303	8-729-905-35	TRANSISTOR 2SC4081-R	
Q304	8-729-905-35	TRANSISTOR 2SC4081-R	
Q306	8-729-905-35	TRANSISTOR 2SC4081-R	
Q307	8-729-905-18	TRANSISTOR DTC144EU	
Q310	8-729-905-35	TRANSISTOR 2SC4081-R	
Q311	8-729-905-35	TRANSISTOR 2SC4081-R	
Q312	8-729-905-12	TRANSISTOR DTA144EU	
Q351	8-729-905-35	TRANSISTOR 2SC4081-R	
Q400	8-729-905-18	TRANSISTOR DTC144EU	
Q404	8-729-904-07	TRANSISTOR FMG2	
Q701	8-729-925-91	TRANSISTOR DTC115EU	
Q702	8-729-907-03	TRANSISTOR FMG5	
Q703	8-729-905-18	TRANSISTOR DTC144EU	
Q704	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q705	8-729-905-24	TRANSISTOR 2SA1576-R	
Q706	8-729-905-18	TRANSISTOR DTC144EU	
Q707	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q708	8-729-905-15	TRANSISTOR DTC144WU	
Q709	8-729-402-32	TRANSISTOR 2SD1819A-R	
Q710	8-729-402-32	TRANSISTOR 2SD1819A-R	

Ref. No.	Part No.	Description			Remark
Q720	8-729-905-18	TRANSISTOR	DTC144EU		
Q726	8-729-402-55	TRANSISTOR	2SB1218A-R		
Q727	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q728	8-729-402-32	TRANSISTOR	2SD1819A-R		
Q729	8-729-905-18	TRANSISTOR	DTC144EU		
Q730	8-729-905-12	TRANSISTOR	DTA144EU		
Q800	8-729-905-18	TRANSISTOR	DTC144EU		
Q801	8-729-402-55	TRANSISTOR	2SB1218A-R		
		< RESISTOR >			
R008	1-216-864-11	METAL CHIP	0		
R009	1-216-864-11	METAL CHIP	0		
R019	1-216-864-11	METAL CHIP	0		
R020	1-216-818-11	METAL CHIP	560	5%	1/16W
R021	1-216-864-11	METAL CHIP	0		
R025	1-216-821-11	METAL CHIP	1K	5%	1/16W
R032	1-216-864-11	METAL CHIP	0		
R034	1-216-821-11	METAL CHIP	1K	5%	1/16W
R036	1-216-823-11	METAL CHIP	1. 5K	5%	1/16W
R041	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R042	1-216-824-11	METAL CHIP	1. 8K	5%	1/16W
R043	1-216-839-11	METAL CHIP	33K	5%	1/16W
R044	1-216-837-11	METAL CHIP	22K	5%	1/16W
R045	1-216-821-11	METAL CHIP	1K	5%	1/16W
R047	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R048	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R049	1-216-821-11	METAL CHIP	1K	5%	1/16W
R050	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R051	1-216-833-11	METAL CHIP	10K	5%	1/16W
R052	1-216-841-11	METAL CHIP	47K	5%	1/16W
R053	1-216-821-11	METAL CHIP	1K	5%	1/16W
R060	1-216-864-11	METAL CHIP	0		
R061	1-216-821-11	METAL CHIP	1K	5%	1/16W
R062	1-216-847-11	METAL CHIP	150K	5%	1/16W
R063	1-216-847-11	METAL CHIP	150K	5%	1/16W
R064	1-216-864-11	METAL CHIP	0		
R065	1-216-817-11	METAL CHIP	470	5%	1/16W
R066	1-216-809-11	METAL CHIP	100	5%	1/16W
R071	1-216-661-11	METAL CHIP	2. 7K	0. 5%	1/10W
R072	1-216-833-11	METAL CHIP	10K	5%	1/16W
R073	1-216-833-11	METAL CHIP	10K	5%	1/16W
R074	1-216-809-11	METAL CHIP	100	5%	1/16W
R087	1-216-831-11	METAL CHIP	6. 8K	5%	1/16W
R089	1-216-838-11	METAL CHIP	27K	5%	1/16W
R093	1-216-819-11	METAL CHIP	680	5%	1/16W
R101	1-216-833-11	METAL CHIP	10K	5%	1/16W
R102	1-216-833-11	METAL CHIP	10K	5%	1/16W
R103	1-216-821-11	METAL CHIP	1K	5%	1/16W
R104	1-216-811-11	METAL CHIP	150	5%	1/16W
R108	1-216-837-11	METAL CHIP	22K	5%	1/16W
R109	1-216-839-11	METAL CHIP	33K	5%	1/16W
R110	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R111	1-216-818-11	METAL CHIP	560	5%	1/16W
R112	1-216-823-11	METAL CHIP	1. 5K	5%	1/16W
R113	1-216-812-11	METAL CHIP	180	5%	1/16W
R114	1-216-834-11	METAL CHIP	12K	5%	1/16W
R115	1-216-833-11	METAL CHIP	10K	5%	1/16W
R116	1-216-817-11	METAL CHIP	470	5%	1/16W
R117	1-216-808-11	METAL CHIP	82	5%	1/16W
R118	1-216-864-11	METAL CHIP	0		
R119	1-216-823-11	METAL CHIP	1. 5K	5%	1/16W
R120	1-216-824-11	METAL CHIP	1. 8K	5%	1/16W
R121	1-216-864-11	METAL CHIP	0		
R124	1-216-821-11	METAL CHIP	1K	5%	1/16W
R125	1-216-836-11	METAL CHIP	18K	5%	1/16W
R126	1-216-836-11	METAL CHIP	18K	5%	1/16W
R127	1-216-821-11	METAL CHIP	1K	5%	1/16W
R128	1-216-864-11	METAL CHIP	0		
R130	1-216-864-11	METAL CHIP	0		
R132	1-216-864-11	METAL CHIP	0		
R133	1-216-818-11	METAL CHIP	560	5%	1/16W
R134	1-216-818-11	METAL CHIP	560	5%	1/16W
R135	1-216-295-00	METAL CHIP	0		
R136	1-216-295-00	METAL CHIP	0		
R137	1-216-295-00	METAL CHIP	0		
R141	1-216-837-11	METAL CHIP	22K	5%	1/16W
R145	1-216-295-00	METAL CHIP	0		
R158	1-216-818-11	METAL CHIP	560	5%	1/16W
R159	1-216-837-11	METAL CHIP	22K	5%	1/16W
R160	1-216-837-11	METAL CHIP	22K	5%	1/16W
R161	1-216-817-11	METAL CHIP	470	5%	1/16W
R162	1-216-817-11	METAL CHIP	470	5%	1/16W
R163	1-216-812-11	METAL CHIP	180	5%	1/16W
R164	1-216-817-11	METAL CHIP	470	5%	1/16W
R165	1-216-809-11	METAL CHIP	100	5%	1/16W
R166	1-216-821-11	METAL CHIP	1K	5%	1/16W
R167	1-216-833-11	METAL CHIP	10K	5%	1/16W
R168	1-216-829-11	METAL CHIP	4. 7K	5%	1/16W
R170	1-216-820-11	METAL CHIP	820	5%	1/16W
R171	1-216-825-11	METAL CHIP	2. 2K	5%	1/16W
R172	1-216-840-11	METAL CHIP	39K	5%	1/16W
R173	1-216-835-11	METAL CHIP	15K	5%	1/16W
R174	1-216-821-11	METAL CHIP	1K	5%	1/16W
R175	1-216-822-11	METAL CHIP	1. 2K	5%	1/16W
R176	1-216-864-11	METAL CHIP	0		
R178	1-216-818-11	METAL CHIP	560	5%	1/16W
R179	1-216-839-11	METAL CHIP	33K	5%	1/16W
R181	1-216-804-11	METAL CHIP	39	5%	1/16W

Ref. No.	Part No.	Description			Remark
R182	1-216-804-11	METAL CHIP	39	5%	1/16W
R183	1-216-807-11	METAL CHIP	68	5%	1/16W
R184	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R185	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R186	1-216-836-11	METAL CHIP	18K	5%	1/16W
R187	1-216-820-11	METAL CHIP	820	5%	1/16W
R188	1-216-833-11	METAL CHIP	10K	5%	1/16W
R191	1-216-841-11	METAL CHIP	47K	5%	1/16W
R192	1-216-841-11	METAL CHIP	47K	5%	1/16W
R193	1-216-833-11	METAL CHIP	10K	5%	1/16W
R201	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R202	1-216-841-11	METAL CHIP	47K	5%	1/16W
R203	1-216-814-11	METAL CHIP	270	5%	1/16W
R204	1-216-821-11	METAL CHIP	1K	5%	1/16W
R207	1-216-864-11	METAL CHIP	0		
R208	1-216-816-11	METAL CHIP	390	5%	1/16W
R209	1-216-814-11	METAL CHIP	270	5%	1/16W
R210	1-216-819-11	METAL CHIP	680	5%	1/16W
R211	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R212	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R213	1-216-817-11	METAL CHIP	470	5%	1/16W
R214	1-216-820-11	METAL CHIP	820	5%	1/16W
R215	1-216-817-11	METAL CHIP	470	5%	1/16W
R216	1-216-817-11	METAL CHIP	470	5%	1/16W
R219	1-216-833-11	METAL CHIP	10K	5%	1/16W
R220	1-216-821-11	METAL CHIP	1K	5%	1/16W
R221	1-216-844-11	METAL CHIP	82K	5%	1/16W
R222	1-216-857-11	METAL CHIP	1M	5%	1/16W
R224	1-216-864-11	METAL CHIP	0		
R225	1-216-839-11	METAL CHIP	33K	5%	1/16W
R226	1-216-817-11	METAL CHIP	470	5%	1/16W
R227	1-216-049-00	METAL CHIP	1K	5%	1/10W
R228	1-216-842-11	METAL CHIP	56K	5%	1/16W
R229	1-216-821-11	METAL CHIP	1K	5%	1/16W
R230	1-216-838-11	METAL CHIP	27K	5%	1/16W
R231	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R232	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R233	1-216-821-11	METAL CHIP	1K	5%	1/16W
R234	1-216-821-11	METAL CHIP	1K	5%	1/16W
R235	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R236	1-216-821-11	METAL CHIP	1K	5%	1/16W
R237	1-216-821-11	METAL CHIP	1K	5%	1/16W
R239	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R241	1-216-833-11	METAL CHIP	10K	5%	1/16W
R243	1-216-864-11	METAL CHIP	0		
R244	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R245	1-216-833-11	METAL CHIP	10K	5%	1/16W
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W
R248	1-216-841-11	METAL CHIP	47K	5%	1/16W
R249	1-216-821-11	METAL CHIP	1K	5%	1/16W
R250	1-216-821-11	METAL CHIP	1K	5%	1/16W
R251	1-216-845-11	METAL CHIP	100K	5%	1/16W
R252	1-216-853-11	METAL CHIP	470K	5%	1/16W
R255	1-216-833-11	METAL CHIP	10K	5%	1/16W
R256	1-216-833-11	METAL CHIP	10K	5%	1/16W
R257	1-216-821-11	METAL CHIP	1K	5%	1/16W
R258	1-216-821-11	METAL CHIP	1K	5%	1/16W
R259	1-216-833-11	METAL CHIP	10K	5%	1/16W
R260	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R261	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R262	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R263	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R265	1-216-643-11	METAL CHIP	470	0.5%	1/10W
R267	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R276	1-216-820-11	METAL CHIP	820	5%	1/16W
R278	1-216-820-11	METAL CHIP	820	5%	1/16W
R280	1-216-841-11	METAL CHIP	47K	5%	1/16W
R281	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R282	1-216-833-11	METAL CHIP	10K	5%	1/16W
R283	1-216-833-11	METAL CHIP	10K	5%	1/16W
R284	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R285	1-216-818-11	METAL CHIP	560	5%	1/16W
R286	1-216-810-11	METAL CHIP	120	5%	1/16W
R287	1-216-813-11	METAL CHIP	220	5%	1/16W
R289	1-216-864-11	METAL CHIP	0		
R290	1-216-815-11	METAL CHIP	330	5%	1/16W
R291	1-216-815-11	METAL CHIP	330	5%	1/16W
R292	1-216-820-11	METAL CHIP	820	5%	1/16W
R293	1-216-808-11	METAL CHIP	82	5%	1/16W
R294	1-216-839-11	METAL CHIP	33K	5%	1/16W
R296	1-216-821-11	METAL CHIP	1K	5%	1/16W
R297	1-216-841-11	METAL CHIP	47K	5%	1/16W
R298	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R300	1-216-809-11	METAL CHIP	100	5%	1/16W
R301	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R302	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R305	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R308	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R309	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R310	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R311	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R312	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R314	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R315	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R316	1-216-699-11	METAL CHIP	100K	0.5%	1/10W
R318	1-216-809-11	METAL CHIP	100	5%	1/16W

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Ref. No.	Part No.	Description				Remark
R319	1-216-864-11	METAL CHIP	0			
R320	1-216-864-11	METAL CHIP	0			
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R323	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R324	1-216-809-11	METAL CHIP	100	5%	1/16W	
R325	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R330	1-216-864-11	METAL CHIP	0			
R331	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R332	1-216-817-11	METAL CHIP	470	5%	1/16W	
R333	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R334	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R335	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R339	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R341	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R342	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R343	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R346	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R347	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R348	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R349	1-216-809-11	METAL CHIP	100	5%	1/16W	
R350	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R364	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R372	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R381	1-216-864-11	METAL CHIP	0			
R390	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R391	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R392	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R393	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R398	1-216-864-11	METAL CHIP	0			
R405	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R407	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R408	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R409	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R410	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R413	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R415	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R416	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R418	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R419	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R420	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R421	1-216-864-11	METAL CHIP	0			
R423	1-216-864-11	METAL CHIP	0			
R426	1-216-817-11	METAL CHIP	470	5%	1/16W	
R427	1-216-807-11	METAL CHIP	68	5%	1/16W	
R428	1-216-817-11	METAL CHIP	470	5%	1/16W	
R429	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R430	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R432	1-216-864-11	METAL CHIP	0			

Ref. No.	Part No.	Description				Remark
R433	1-216-864-11	METAL CHIP	0			
R434	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R435	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R459	1-216-864-11	METAL CHIP	0			
R466	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R483	1-216-864-11	METAL CHIP	0			
R485	1-216-864-11	METAL CHIP	0			
R486	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R490	1-216-864-11	METAL CHIP	0			
R491	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R602	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R606	1-216-864-11	METAL CHIP	0			
R607	1-216-864-11	METAL CHIP	0			
R608	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R621	1-216-864-11	METAL CHIP	0			
R624	1-216-864-11	METAL CHIP	0			
R630	1-216-864-11	METAL CHIP	0			
R636	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R700	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R702	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R704	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R706	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R708	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R711	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R713	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R715	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R716	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R720	1-216-864-11	METAL CHIP	0			
R722	1-216-817-11	METAL CHIP	470	5%	1/16W	
R723	1-216-295-00	METAL CHIP	0	5%	1/10W	
R724	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R725	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R729	1-216-864-11	METAL CHIP	0			
R731	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R732	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R734	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R735	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R736	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R737	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R739	1-216-295-00	METAL CHIP	0			
R740	1-216-295-00	METAL CHIP	0			
R741	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R742	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R745	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R747	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R748	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R749	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R750	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R751	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	

Ref. No.	Part No.	Description			Remark
R753	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R754	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R756	1-216-864-11	METAL CHIP	0		
R758	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R759	1-216-806-11	METAL GLAZE	56	5%	1/16W
R760	1-216-821-11	METAL CHIP	1K	5%	1/16W
R761	1-216-814-11	METAL CHIP	270	5%	1/16W
R762	1-216-845-11	METAL CHIP	100K	5%	1/16W
R763	1-216-843-11	METAL CHIP	68K	5%	1/16W
R764	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R766	1-216-857-11	METAL CHIP	1M	5%	1/16W
R770	1-216-864-11	METAL CHIP	0		
R772	1-216-864-11	METAL CHIP	0		
R776	1-216-818-11	METAL CHIP	560	5%	1/16W
R777	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R780	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R781	1-216-836-11	METAL CHIP	18K	5%	1/16W
R782	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R783	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R784	1-216-821-11	METAL CHIP	1K	5%	1/16W
R787	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R788	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R789	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R793	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R795	1-216-864-11	METAL CHIP	0		
R796	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R797	1-216-833-11	METAL CHIP	10K	5%	1/16W
R798	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R901	1-216-864-11	METAL CHIP	0		
R902	1-216-864-11	METAL CHIP	0		
R903	1-216-864-11	METAL CHIP	0		
R904	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R905	1-216-845-11	METAL CHIP	100K	5%	1/16W
R906	1-216-845-11	METAL CHIP	100K	5%	1/16W
R907	1-216-839-11	METAL CHIP	33K	5%	1/16W
R908	1-216-845-11	METAL CHIP	100K	5%	1/16W
R909	1-216-833-11	METAL CHIP	10K	5%	1/16W
R910	1-216-864-11	METAL CHIP	0		
R911	1-216-838-11	METAL CHIP	27K	5%	1/16W
R913	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R914	1-216-833-11	METAL CHIP	10K	5%	1/16W
R915	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R916	1-216-833-11	METAL CHIP	10K	5%	1/16W
R917	1-216-842-11	METAL CHIP	56K	5%	1/16W
R918	1-216-834-11	METAL CHIP	12K	5%	1/16W
R919	1-216-864-11	METAL CHIP	0		
R920	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R921	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R923	1-216-824-11	METAL CHIP	1.8K	5%	1/16W
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W
R925	1-216-821-11	METAL CHIP	1K	5%	1/16W
R926	1-216-833-11	METAL CHIP	10K	5%	1/16W
R927	1-216-864-11	METAL CHIP	0		
R930	1-216-864-11	METAL CHIP	0		
R932	1-216-864-11	METAL CHIP	0		
R933	1-216-841-11	METAL CHIP	47K	5%	1/16W
R934	1-216-840-11	METAL CHIP	39K	5%	1/16W
R959	1-216-836-11	METAL CHIP	18K	5%	1/16W
R960	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R961	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R962	1-216-821-11	METAL CHIP	1K	5%	1/16W
R963	1-216-815-11	METAL CHIP	330	5%	1/16W
R964	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R965	1-216-833-11	METAL CHIP	10K	5%	1/16W
R967	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R968	1-216-814-11	METAL CHIP	270	5%	1/16W
R969	1-216-833-11	METAL CHIP	10K	5%	1/16W
R970	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R976	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R977	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R978	1-216-833-11	METAL CHIP	10K	5%	1/16W
R979	1-216-864-11	METAL CHIP	0		
R982	1-216-809-11	METAL CHIP	100	5%	1/16W
R983	1-216-809-11	METAL CHIP	100	5%	1/16W
R984	1-216-809-11	METAL CHIP	100	5%	1/16W

< VARIABLE RESISTOR >

RV101	1-238-087-11	RES, ADJ CERMET	1K
RV201	1-238-091-11	RES, ADJ CERMET	22K
RV202	1-238-087-11	RES, ADJ CERMET	1K
RV203	1-238-088-11	RES, ADJ CERMET	2.2K
RV204	1-238-087-11	RES, ADJ CERMET	1K
RV205	1-238-091-11	RES, ADJ CERMET	22K
RV206	1-238-088-11	RES, ADJ CERMET	2.2K
RV207	1-238-089-11	RES, ADJ CERMET	4.7K
RV210	1-238-088-11	RES, ADJ CERMET	2.2K
RV211	1-238-092-11	RES, ADJ CERMET	47K
RV301	1-238-086-11	RES, ADJ CERMET	470
RV400	1-238-090-11	RES, ADJ CERMET	10K
RV401	1-238-090-11	RES, ADJ CERMET	10K
RV702	1-238-089-11	RES, ADJ CERMET	4.7K
RV703	1-238-092-11	RES, ADJ CERMET	47K

< SWITCH >

S201	1-572-275-11	SWITCH, SLIDE (IN-OUT)

Ref. No.	Part No.	Description	Remark
		< THERMISTOR >	
TH700	1-800-071-XX	THERMISTER, S-300	
		< FLEXIBLE BOARD >	
W702	1-633-976-11	FP-251 FLEXIBLE BOARD	
W704	1-633-979-11	FP-299 FLEXIBLE BOARD	
		< CRYSTAL >	
X301	1-577-080-11	VIBRATOR, CRYSTAL (3.58MHz)	
X701	1-567-900-11	CRYSTAL (14.3MHz)	
X703	1-578-690-11	VIBRATOR, CERAMIC (500KHz)	
**			
	1-628-060-12	FP-89 FLEXIBLE BOARD ********************* (Ref. No 8,000 Series)	
		< DIODE >	
D301	8-719-820-44	PHOTO COUPLER TLP-907-0	
		< TRANSISTOR >	
Q301	8-729-906-48	PHOTO SENSOR EE-TP109	
		< SWITCH >	
S301	1-572-173-11	SWITCH, SLIDE (ENCODER)	
**			
	1-628-061-12	FP-90 FLEXIBLE BOARD ********************* (Ref. No 8,000 Series)	
		< DIODE >	
D302	8-719-940-81	DIODE GL452S	
D303	8-719-820-44	PHOTO COUPLER TLP-907-0	
		< TRANSISTOR >	
Q302	8-729-906-48	PHOTO SENSOR EE-TP109	
		< SWITCH >	
S302	1-572-298-11	SWITCH, PUSH (REC PROOF/TAPE SELECT)	
**			

Ref. No.	Part No.	Description	Remark
	* A-7062-638-A	FU-100 BOARD, COMPLETE ********************* (Ref. No 5,000 Series)	
	1-537-281-21	TERMINAL BOARD (EASY CONNECTOR)	
		< CAPACITOR >	
C503	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C504	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C505	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C506	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C507	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C514	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C515	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C516	1-135-149-21	TANTALUM CHIP 2.2uF 20% 10V	
C517	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C518	1-135-155-21	TANTALUM CHIP 4.7uF 10% 10V	
C519	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C994	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C995	1-128-292-11	ELECT 220uF 20% 10V	
C996	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
		< CONNECTOR >	
CN502	1-569-480-11	CONNECTOR, FPC 23P	
CN992	1-565-528-11	PIN, CONNECTOR (PC BOARD) 3P	
		< TRIMMER >	
CT501	1-141-331-11	CAP, CHIP TRIMMER	
CT501	1-141-424-11	CAP, ADJ	
		< DIODE >	
D501	⚠ 8-719-421-27	DIODE MA728	
D503	8-719-404-46	DIODE MA110	
D504	8-719-404-46	DIODE MA110	
D505	8-719-404-46	DIODE MA110	
D510	8-719-812-41	LED TLR124, RED	
D511	8-719-404-46	DIODE MA110	
		< FUSE >	
F990	⚠ 1-532-778-21	FUSE, MICRO (1.6A 125V)	
F991	⚠ 1-532-777-21	FUSE, MICRO (1.25A 125V)	
F992	⚠ 1-532-777-21	FUSE, MICRO (1.25A 125V)	
		< IC >	
IC501	8-759-154-18	IC uPD75316GF-116-3B9	
IC502	8-759-511-22	IC CXA1448N	
IC503	8-759-937-54	IC S-81250HG-RD-S	

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

< COIL >

Ref. No.	Part No.	Description	Remark
L501	1-412-032-11	INDUCTOR CHIP 100uH	
L990	1-412-026-11	INDUCTOR CHIP 1uH	
L991	1-410-337-11	INDUCTOR 1uH	
L992	1-410-337-11	INDUCTOR 1uH	
L996	1-412-026-11	INDUCTOR CHIP 1uH	
L997	1-412-026-11	INDUCTOR CHIP 1uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q509	8-729-904-20	TRANSISTOR FMA2	
Q579	8-729-905-12	TRANSISTOR DTA144EU	
Q990	8-729-101-07	TRANSISTOR 2SB798-DL	
Q991	8-729-905-35	TRANSISTOR 2SC4081-R	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R501	1-216-841-11	METAL CHIP 47K 5%	1/16W
R505	1-216-821-11	METAL CHIP 1K 5%	1/16W
R511	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R512	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R513	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R514	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R515	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R516	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R517	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R518	1-216-851-11	METAL CHIP 330K 5%	1/16W
R520	1-216-864-11	METAL CHIP 0	
R521	1-216-809-11	METAL CHIP 100 5%	1/16W
R522	1-216-809-11	METAL CHIP 100 5%	1/16W
R523	1-216-841-11	METAL CHIP 47K 5%	1/16W
R524	1-216-841-11	METAL CHIP 47K 5%	1/16W
R525	1-216-841-11	METAL CHIP 47K 5%	1/16W
R527	1-216-841-11	METAL CHIP 47K 5%	1/16W
R528	1-216-841-11	METAL CHIP 47K 5%	1/16W
R529	1-216-841-11	METAL CHIP 47K 5%	1/16W
R530	1-216-841-11	METAL CHIP 47K 5%	1/16W
R531	1-216-809-11	METAL CHIP 100 5%	1/16W
R532	1-216-809-11	METAL CHIP 100 5%	1/16W
R533	1-216-821-11	METAL CHIP 1K 5%	1/16W
R534	1-216-821-11	METAL CHIP 1K 5%	1/16W
R535	1-216-821-11	METAL CHIP 1K 5%	1/16W
R536	1-216-821-11	METAL CHIP 1K 5%	1/16W
R537	1-216-817-11	METAL CHIP 470 5%	1/16W
R538	1-216-821-11	METAL CHIP 1K 5%	1/16W
R542	1-216-833-11	METAL CHIP 10K 5%	1/16W
R543	1-216-833-11	METAL CHIP 10K 5%	1/16W
R544	1-216-833-11	METAL CHIP 10K 5%	1/16W
R545	1-216-821-11	METAL CHIP 1K 5%	1/16W
R546	1-216-821-11	METAL CHIP 1K 5%	1/16W
R547	1-216-833-11	METAL CHIP 10K 5%	1/16W
R548	1-216-833-11	METAL CHIP 10K 5%	1/16W
R549	1-216-833-11	METAL CHIP 10K 5%	1/16W
R550	1-216-833-11	METAL CHIP 10K 5%	1/16W
R551	1-216-833-11	METAL CHIP 10K 5%	1/16W
R552	1-216-833-11	METAL CHIP 10K 5%	1/16W
R553	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R557	1-216-861-11	METAL CHIP 2.2M 5%	1/16W
R558	1-216-841-11	METAL CHIP 47K 5%	1/16W
R559	1-216-841-11	METAL CHIP 47K 5%	1/16W
R563	1-216-864-11	METAL CHIP 0	
R564	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R571	1-216-829-11	METAL CHIP 4.7K 5%	1/16W
R572	1-216-821-11	METAL CHIP 1K 5%	1/16W
R573	1-216-821-11	METAL CHIP 1K 5%	1/16W
R575	1-216-864-11	METAL CHIP 0	
R576	1-216-864-11	METAL CHIP 0	
R577	1-216-864-11	METAL CHIP 0	
R578	1-216-833-11	METAL CHIP 10K 5%	1/16W
R579	1-216-864-11	METAL CHIP 0	
R590	1-216-833-11	METAL CHIP 10K 5%	1/16W
R990	1-216-138-00	METAL CHIP 3.3 5%	1/8W
R991	1-216-830-11	METAL CHIP 5.6K 5%	1/16W
R992	1-216-820-11	METAL CHIP 820 5%	1/16W
R993	1-216-836-11	METAL CHIP 18K 5%	1/16W
R994	1-216-807-11	METAL CHIP 68 5%	1/16W

< SWITCH >

Ref. No.	Part No.	Description	Remark
S501	1-571-275-31	SWITCH, SLIDE (REMOTE COMMANDER ON/OFF)	
S502	1-572-284-11	SWITCH, SLIDE (EJECT)	

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description	Remark
W501	1-633-978-11	FP-295 FLEXIBLE BOARD	
W502	1-633-977-11	FP-293 FLEXIBLE BOARD	
W901	1-633-982-11	FP-294 FLEXIBLE BOARD	

< CRYSTAL >

Ref. No.	Part No.	Description	Remark
X501	1-577-101-11	VIBRATOR, CERAMIC	
X502	1-527-997-21	VIBRATOR, CRYSTAL	

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* 1-638-494-11 LI-39 BOARD (Ref. No 5,000 Series)
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< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C970	1-163-035-00	CERAMIC CHIP 0.047uF	50V
C971	1-163-035-00	CERAMIC CHIP 0.047uF	50V

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN961	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P	

Ref. No.	Part No.	Description			Remark
		< JACK >			
J902	1-550-104-11	HOLDER, BATTERY (LITHIUM)			
***					
*	A-7062-643-A	MC-76 BOARD, COMPLETE			
		*********************			
		(Ref.No 4,000 Series)			
		< CAPACITOR >			
C650	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C651	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C652	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C653	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C655	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C656	1-126-154-11	ELECT	47uF	20%	6.3V
C657	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C659	1-162-638-11	CERAMIC CHIP	1uF		16V
C674	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C675	1-162-638-11	CERAMIC CHIP	1uF		16V
C677	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C678	1-126-155-11	ELECT	100uF	20%	6.3V
C681	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C683	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C685	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C687	1-162-638-11	CERAMIC CHIP	1uF		16V
		< CONNECTOR >			
CN650	1-565-528-11	PIN, CONNECTOR (PC BOARD) 3P			
CN652	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P			
		< DIODE >			
D652	8-719-106-43	DIODE RD9.1M-B1			
D655	8-719-404-46	DIODE MA110			
		< IC >			
IC650	8-759-822-37	IC LA7293M-TE-L			
		< JACK >			
J650	1-507-899-31	JACK (SMALL TYPE)			
J651	1-563-454-11	JACK, MINIATURE			
		< COIL >			
L650	1-410-369-11	INDUCTOR CHIP	1uH		
L652	1-410-192-51	INDUCTOR CHIP	1uH		
L653	1-410-192-51	INDUCTOR CHIP	1uH		
L654	1-410-369-11	INDUCTOR CHIP	1uH		

Ref. No.	Part No.	Description			Remark
		< TRANSISTOR >			
Q650	8-729-109-44	TRANSISTOR 2SK94			
Q651	8-729-905-35	TRANSISTOR 2SC4081-R			
		< RESISTOR >			
R650	1-216-833-11	METAL CHIP	10K	5%	1/16W
R651	1-216-818-11	METAL CHIP	560	5%	1/16W
R652	1-216-833-11	METAL CHIP	10K	5%	1/16W
R653	1-216-844-11	METAL CHIP	82K	5%	1/16W
R654	1-216-845-11	METAL CHIP	100K	5%	1/16W
R655	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R656	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R664	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R665	1-216-837-11	METAL CHIP	22K	5%	1/16W
R675	1-216-864-11	METAL CHIP	0		
R680	1-216-857-11	METAL CHIP	1M	5%	1/16W
R681	1-216-841-11	METAL CHIP	47K	5%	1/16W
R682	1-216-864-11	METAL CHIP	0		
R696	1-216-864-11	METAL CHIP	0		
		< SWITCH >			
S650	1-553-977-00	SWITCH, SLIDE (BUILT IN MIC/WIND)			
S651	1-571-787-41	SWITCH, TACTILE (REC START/STOP)			
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*	A-7020-141-A	R BOARD, ASSY			
		*************			
		(Including the CK-50, DK-15, ED-32, RM-50 and ZK-14 boards.)			
*	A-7062-642-A	CK-50 BOARD, COMPLETE (Ref.No 5,000 Series)			
*	A-7062-641-A	DK-15 BOARD, COMPLETE (Ref.No 5,000 Series)			
*	1-638-490-11	ED-32 BOARD (Ref.No 5,000 Series) RM-50 BOARD (Ref.No 5,000 Series)			
*	1-638-488-11	ZK-14 BOARD (Ref.No 5,000 Series)			
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	1-633-984-11	FP-297 FLEXIBLE BOARD			
	1-633-985-11	FP-298 FLEXIBLE BOARD			
*	3-744-909-01	HOLDER (CK), LCD			
		< CAPACITOR >			
C670	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C950	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C951	1-163-003-11	CERAMIC CHIP	330PF	10%	50V
C952	1-163-005-11	CERAMIC CHIP	470PF	10%	50V

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN670	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P	
CN950	1-569-478-21	CONNECTOR, FPC 20P	
		< DIODE >	
D671	8-719-404-46	DIODE MA110	
D672	8-719-404-46	DIODE MA110	
D920	8-719-941-34	DIODE GL1HD51	
		< IC >	
IC670	8-759-634-72	IC M34206M2-109FP	
IC950	8-759-145-63	IC uPD7564G-540	
IC960	8-749-921-76	IC GP1U56	
		< DISPLAY PANEL >	
ND670	1-809-022-11	DISPLAY PANEL, LIQUID CRYSTAL	
		< TRANSISTOR >	
Q950	8-729-901-01	TRANSISTOR DTC144EK	
		< RESISTOR >	
R670	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R671	1-216-295-00	METAL CHIP 0 5% 1/10W	
R672	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R675	1-216-296-00	METAL CHIP 0 5% 1/8W	
R950	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R951	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R952	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R953	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R954	1-216-029-00	METAL CHIP 150 5% 1/10W	
R955	1-216-025-00	METAL CHIP 100 5% 1/10W	
R961	1-216-049-00	METAL CHIP 1K 5% 1/10W	
		< SWITCH >	
S670	1-570-870-11	SWITCH, SLIDE (AUTO LOCK)	
S671	1-571-787-11	SWITCH, TACTILE (SHUTTER SPEED)	
S672	1-571-787-11	SWITCH, TACTILE (PROGRAM AE)	
S673	1-571-787-11	SWITCH, TACTILE (FOCUS)	
S674	1-571-787-11	SWITCH, TACTILE (PUSH AUTO)	
S675	1-571-787-11	SWITCH, TACTILE (BACK LIGHT)	
S676	1-571-787-11	SWITCH, TACTILE (WHT BAL)	
S680	1-571-684-11	SWITCH, TACTIL (MACRO AF)	
S681	1-571-684-11	SWITCH, TACTIL (FADER)	
S920	1-571-684-11	SWITCH, TACTIL (EDITSERCH -)	
S921	1-571-684-11	SWITCH, TACTIL (EDITSERCH +)	
S950	1-571-684-11	SWITCH, TACTIL (TITLE)	
S951	1-571-684-11	SWITCH, TACTIL (MIX)	
S952	1-571-684-11	SWITCH, TACTIL (COLOR/MODE)	
S953	1-571-684-11	SWITCH, TACTIL (MEMORY)	
		< CONNECTOR >	
W922	1-566-095-11	PIN, BOARD TO BOARD 6P	
		< CRYSTAL >	
X670	1-567-152-00	VIBRATOR, CERAMIC (4MHz)	
X950	1-577-163-21	VIBLATOR, CERAMIC (700KHz)	
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	* A-7062-610-A	SS-136 BOARD, COMPLETE	
		**********************	
		(Ref. No 3, 000 Series)	
	1-633-923-11	FP-252 FLEXIBLE BOARD	
	1-633-924-11	FP-248 FLEXIBLE BOARD	
	3-831-441-11	CLOTH, UNWEAVED (25X6X0. 5)	
		< CAPACITOR >	
C400	1-162-970-11	CERAMIC CHIP 0. 01uF 10% 25V	
C401	1-162-970-11	CERAMIC CHIP 0. 01uF 10% 25V	
C402	1-162-970-11	CERAMIC CHIP 0. 01uF 10% 25V	
C409	1-163-038-00	CERAMIC CHIP 0. 1uF 25V	
C501	1-126-157-11	ELECT 10uF 20% 16V	
C502	1-126-160-11	ELECT 1uF 20% 50V	
C504	1-163-038-00	CERAMIC CHIP 0. 1uF 25V	
C505	1-164-633-11	CERAMIC CHIP 0. 1uF 10% 25V	
C506	1-126-163-11	ELECT 4. 7uF 20% 50V	
C507	1-164-330-21	CERAMIC CHIP 0. 22uF 10% 16V	
C508	1-164-330-21	CERAMIC CHIP 0. 22uF 10% 16V	
C509	1-162-967-11	CERAMIC CHIP 0. 0033uF 10% 50V	
C510	1-162-967-11	CERAMIC CHIP 0. 0033uF 10% 50V	
C511	1-162-967-11	CERAMIC CHIP 0. 0033uF 10% 50V	
C512	1-164-232-11	CERAMIC CHIP 0. 01uF 50V	
C513	1-128-078-11	ELECT 33uF 20% 10V	
C514	1-130-495-00	MYLAR 0. 1uF 5% 50V	
C515	1-162-964-11	CERAMIC CHIP 0. 001uF 10% 50V	
C516	1-164-633-11	CERAMIC CHIP 0. 1uF 10% 25V	
C517	1-162-969-11	CERAMIC CHIP 0. 0068uF 10% 25V	
C518	1-163-038-00	CERAMIC CHIP 0. 1uF 25V	
C519	1-164-330-21	CERAMIC CHIP 0. 22uF 10% 16V	
C520	1-164-330-21	CERAMIC CHIP 0. 22uF 10% 16V	
C521	1-164-330-21	CERAMIC CHIP 0. 22uF 10% 16V	
C522	1-162-638-11	CERAMIC CHIP 1uF 16V	
C523	1-128-078-11	ELECT 33uF 20% 10V	
C524	1-163-035-00	CERAMIC CHIP 0. 047uF 50V	
C525	1-126-162-11	ELECT 3. 3uF 20% 50V	
C526	1-163-038-00	CERAMIC CHIP 0. 1uF 25V	

Ref. No.	Part No.	Description			Remark
C527	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C528	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C529	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C530	1-126-157-11	ELECT	10uF	20%	16V
C531	1-126-157-11	ELECT	10uF	20%	16V
C532	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C533	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C534	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C535	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C536	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C537	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C538	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C539	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C540	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C541	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C542	1-164-247-11	CERAMIC CHIP	0.047uF	10%	16V
C543	1-164-247-11	CERAMIC CHIP	0.047uF	10%	16V
C545	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C546	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C547	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C548	1-162-638-11	CERAMIC CHIP	1uF		16V
C549	1-162-638-11	CERAMIC CHIP	1uF		16V
C550	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C551	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C552	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C553	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C554	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C555	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C556	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C557	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C559	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C560	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C561	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C562	1-126-157-11	ELECT	10uF	20%	16V
C563	1-126-157-11	ELECT	10uF	20%	16V
C564	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C565	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C566	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C567	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C568	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C569	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C592	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C609	1-128-078-11	ELECT	33uF	20%	10V
C610	1-124-589-11	ELECT	47uF	20%	16V
C620	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C625	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C720	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C901	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C902	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C903	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C904	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C905	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C906	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C907	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C908	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C909	1-128-078-11	ELECT	33uF	20%	10V
C910	1-128-078-11	ELECT	33uF	20%	10V
C911	1-128-078-11	ELECT	33uF	20%	10V
C912	1-127-558-11	ELECT (SOLID)	10uF	20%	10V
C913	1-128-078-11	ELECT	33uF	20%	10V
C914	1-127-561-11	ELECT (SOLID)	33uF	20%	10V
C915	1-127-558-11	ELECT (SOLID)	10uF	20%	10V
C916	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C917	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C918	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C920	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C921	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C922	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C923	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C925	1-164-217-11	CERAMIC CHIP	150PF	0.25PF	50V
C930	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C931	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C932	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C935	1-164-156-11	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

Ref. No.	Part No.	Description
CN501	* 1-565-211-11	CONNECTOR, FPC (ZIF) 22P
CN502	1-569-364-21	CONNECTOR, FPC 19P
CN503	1-565-878-11	PIN, CONNECTOR (PC BOARD) 6P
CN505	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P
CN506	1-569-627-11	CONNECTOR, BOARD TO BOARD 16P
CN507	1-569-626-11	CONNECTOR, BOARD TO BOARD 20P
CN508	1-565-530-11	PIN, CONNECTOR (PC BOARD) 5P
CN509	1-568-207-11	CONNECTOR, FPC (ZIF) 23P

< DIODE >

Ref. No.	Part No.	Description	
D501	8-719-941-86	DIODE	DAN202U
D506	8-719-941-86	DIODE	DAN202U
D510	8-719-404-46	DIODE	MA110
D901	8-719-938-75	DIODE	SB05-05CP
D902	8-719-938-75	DIODE	SB05-05CP
D903	8-719-938-78	DIODE	SB10-05PCP

< IC >

Ref. No.	Part No.	Description	
IC501	8-752-818-70	IC	CXP80116-826Q
IC502	8-759-148-05	IC	CXA8010M
IC503	8-759-990-55	IC	CXA8006M

Ref. No.	Part No.	Description	Remark
IC504	8-759-805-06	IC CXA1127M	
IC506	8-752-035-48	IC CXA1204Q	
IC507	8-759-998-92	IC LM393D	
IC508	8-759-748-65	IC BR93CS46F	
IC901	8-759-500-42	IC MB3783PFV	
		< COIL >	
L503	1-408-795-21	INDUCTOR, CHIP 330uH	
L505	1-410-381-11	INDUCTOR CHIP 10uH	
L515	1-412-028-11	INDUCTOR, CHIP 4.7uH	
L901	1-424-104-11	COIL, CHOKE 10uH	
L902	1-424-104-11	COIL, CHOKE 10uH	
L903	LS1-424-106-11	COIL, CHOKE 47uH	
L904	LS1-424-106-11	COIL, CHOKE 47uH	
L905	1-424-105-11	COIL, CHOKE 22uH	
L906	LS1-412-027-11	INDUCTOR CHIP 2.2uH	
L907	1-412-029-11	INDUCTOR, CHIP 10uH	
L908	1-412-029-11	INDUCTOR, CHIP 10uH	
L909	1-412-029-11	INDUCTOR, CHIP 10uH	
		< IC LINK >	
PS501 ⚠	1-532-605-00	LINK, IC 0.4A ICP-N10	
		< TRANSISTOR >	
Q400	8-729-905-35	TRANSISTOR 2SC4081-R	
Q401	8-729-905-35	TRANSISTOR 2SC4081-R	
Q402	8-729-905-35	TRANSISTOR 2SC4081-R	
Q502	8-729-905-35	TRANSISTOR 2SC4081-R	
Q503	8-729-905-24	TRANSISTOR 2SA1576-S	
Q505	8-729-905-35	TRANSISTOR 2SC4081-R	
Q506	8-729-905-24	TRANSISTOR 2SA1576-S	
Q507	8-729-905-35	TRANSISTOR 2SC4081-R	
Q508	8-729-905-24	TRANSISTOR 2SA1576-S	
Q509	8-729-905-35	TRANSISTOR 2SC4081-R	
Q510	8-729-905-35	TRANSISTOR 2SC4081-R	
Q511	8-729-905-24	TRANSISTOR 2SA1576-S	
Q512	8-729-907-00	TRANSISTOR DTC114EU	
Q513	8-729-905-35	TRANSISTOR 2SC4081-R	
Q514	8-729-905-35	TRANSISTOR 2SC4081-R	
Q515	8-729-905-18	TRANSISTOR DTC144EU	
Q516	8-729-905-18	TRANSISTOR DTC144EU	
Q540	8-729-822-48	TRANSISTOR FC101	
Q901	8-729-805-25	TRANSISTOR 2SB1121	
Q902	8-729-805-25	TRANSISTOR 2SB1121	
Q903	8-729-805-25	TRANSISTOR 2SB1121	
Q904	8-729-820-47	TRANSISTOR 2SB1202FAT	
Q905	8-729-905-35	TRANSISTOR 2SC4081-R	

Ref. No.	Part No.	Description	Remark
		< RESISTOR >	
R400	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R401	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R402	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R403	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R404	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R405	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R406	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R407	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R408	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R409	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R417	1-216-864-11	METAL CHIP 0	
R418	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R419	1-216-864-11	METAL CHIP 0	
R501	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R502	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R503	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R504	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R507	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R508	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R510	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R511	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R512	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R513	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R514	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R515	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R516	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R517	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R518	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R519	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R520	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R521	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R522	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R523	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R524	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R525	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R526	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R527	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R528	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R529	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R530	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R531	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R532	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R534	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R535	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R536	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R537	1-216-833-11	METAL CHIP 10K 5% 1/16W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	**Note:** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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Ref. No.	Part No.	Description			Remark
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W
R539	1-216-833-11	METAL CHIP	10K	5%	1/16W
R540	1-216-843-11	METAL CHIP	68K	5%	1/16W
R541	1-216-833-11	METAL CHIP	10K	5%	1/16W
R542	1-216-837-11	METAL CHIP	22K	5%	1/16W
R543	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R544	1-216-837-11	METAL CHIP	22K	5%	1/16W
R545	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R546	1-216-837-11	METAL CHIP	22K	5%	1/16W
R547	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R548	1-217-671-11	METAL CHIP	1	5%	1/10W
R549	1-217-671-11	METAL CHIP	1	5%	1/10W
R550	1-217-671-11	METAL CHIP	1	5%	1/10W
R551	1-217-671-11	METAL CHIP	1	5%	1/10W
R552	1-216-037-00	METAL CHIP	330	5%	1/10W
R553	1-216-833-11	METAL CHIP	10K	5%	1/16W
R555	1-216-845-11	METAL CHIP	100K	5%	1/16W
R556	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R558	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R559	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R560	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R561	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R562	1-216-813-11	METAL CHIP	220	5%	1/16W
R563	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R564	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R565	1-216-789-11	METAL CHIP	2.2	5%	1/16W
R566	1-216-833-11	METAL CHIP	10K	5%	1/16W
R567	1-216-833-11	METAL CHIP	10K	5%	1/16W
R568	1-216-817-11	METAL CHIP	470	5%	1/16W
R569	1-216-817-11	METAL CHIP	470	5%	1/16W
R572	1-216-841-11	METAL CHIP	47K	5%	1/16W
R573	1-216-841-11	METAL CHIP	47K	5%	1/16W
R574	1-216-841-11	METAL CHIP	47K	5%	1/16W
R575	1-216-817-11	METAL CHIP	470	5%	1/16W
R576	1-216-813-11	METAL CHIP	220	5%	1/16W
R577	1-216-811-11	METAL CHIP	150	5%	1/16W
R578	1-216-817-11	METAL CHIP	470	5%	1/16W
R579	1-216-803-11	METAL CHIP	33	5%	1/16W
R582	1-216-864-11	METAL CHIP	0		
R583	1-216-833-11	METAL CHIP	10K	5%	1/16W
R586	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R587	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R589	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R590	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R591	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R592	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R594	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R595	1-216-839-11	METAL CHIP	33K	5%	1/16W
R596	1-216-833-11	METAL CHIP	10K	5%	1/16W
R597	1-216-821-11	METAL CHIP	1K	5%	1/16W
R598	1-216-807-11	METAL CHIP	68	5%	1/16W
R599	1-216-811-11	METAL CHIP	150	5%	1/16W
R600	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R601	1-216-839-11	METAL CHIP	33K	5%	1/16W
R602	1-216-841-11	METAL CHIP	47K	5%	1/16W
R603	1-216-857-11	METAL CHIP	1M	5%	1/16W
R604	1-216-837-11	METAL CHIP	22K	5%	1/16W
R605	1-216-833-11	METAL CHIP	10K	5%	1/16W
R606	1-216-837-11	METAL CHIP	22K	5%	1/16W
R607	1-216-851-11	METAL CHIP	330K	5%	1/16W
R608	1-216-857-11	METAL CHIP	1M	5%	1/16W
R609	1-216-833-11	METAL CHIP	10K	5%	1/16W
R610	1-216-845-11	METAL CHIP	100K	5%	1/16W
R611	1-216-845-11	METAL CHIP	100K	5%	1/16W
R613	1-216-845-11	METAL CHIP	100K	5%	1/16W
R614	1-216-833-11	METAL CHIP	10K	5%	1/16W
R615	1-216-851-11	METAL CHIP	330K	5%	1/16W
R616	1-216-857-11	METAL CHIP	1M	5%	1/16W
R618	1-216-847-11	METAL CHIP	150K	5%	1/16W
R619	1-216-837-11	METAL CHIP	22K	5%	1/16W
R620	1-216-837-11	METAL CHIP	22K	5%	1/16W
R621	1-216-857-11	METAL CHIP	1M	5%	1/16W
R622	1-216-821-11	METAL CHIP	1K	5%	1/16W
R623	1-216-833-11	METAL CHIP	10K	5%	1/16W
R624	1-216-833-11	METAL CHIP	10K	5%	1/16W
R625	1-216-845-11	METAL CHIP	100K	5%	1/16W
R626	1-216-833-11	METAL CHIP	10K	5%	1/16W
R627	1-216-833-11	METAL CHIP	10K	5%	1/16W
R628	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R629	1-216-182-00	METAL GLAZE	220	5%	1/8W
R630	1-216-182-00	METAL GLAZE	220	5%	1/8W
R631	1-216-815-11	METAL CHIP	330	5%	1/16W
R632	1-216-813-11	METAL CHIP	220	5%	1/16W
R689	1-216-841-11	METAL CHIP	47K	5%	1/16W
R714	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R715	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R716	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R717	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R719	1-216-841-11	METAL CHIP	47K	5%	1/16W
R720	1-216-841-11	METAL CHIP	47K	5%	1/16W
R726	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R727	1-216-833-11	METAL CHIP	10K	5%	1/16W
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W
R730	1-216-835-11	METAL CHIP	15K	5%	1/16W
R735	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R761	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R762	1-216-827-11	METAL CHIP	3.3K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R763	1-216-837-11	METAL CHIP	22K	5%	1/16W
R764	1-216-857-11	METAL CHIP	1M	5%	1/16W
R765	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R810	1-216-841-11	METAL CHIP	47K	5%	1/16W
R811	1-216-821-11	METAL CHIP	1K	5%	1/16W
R812	1-216-821-11	METAL CHIP	1K	5%	1/16W
R813	1-216-821-11	METAL CHIP	1K	5%	1/16W
R840	1-216-296-00	METAL CHIP	0		
R841	1-216-296-00	METAL CHIP	0		
R842	1-216-296-00	METAL CHIP	0		
R850	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R851	1-216-864-11	METAL CHIP	0		
R855	1-216-864-11	METAL CHIP	0		
R857	1-216-861-11	METAL CHIP	2.2M	5%	1/16W
R901	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R902	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R903	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R904	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R905	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R906	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R907	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R908	1-216-166-00	METAL GLAZE	47	5%	1/8W
R909	1-216-166-00	METAL GLAZE	47	5%	1/8W
R910	1-216-164-00	METAL GLAZE	39	5%	1/8W
R911	1-216-845-11	METAL CHIP	100K	5%	1/16W
R912	1-216-833-11	METAL CHIP	10K	5%	1/16W
R913	1-216-813-11	METAL CHIP	220	5%	1/16W
R914	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R915	1-216-833-11	METAL CHIP	10K	5%	1/16W
R916	1-216-833-11	METAL CHIP	10K	5%	1/16W
R924	1-216-821-11	METAL CHIP	1K	5%	1/16W
R927	1-216-833-11	METAL CHIP	10K	5%	1/16W
		< VARIABLE RESISTOR >			
RV901	1-238-089-11	RES, ADJ CERMET 4.7K			
RV902	1-238-087-11	RES, ADJ CERMET 1K			
		< CONNECTOR >			
W505	1-562-880-11	CONNECTOR, CARD EDGE 15P			
W510	1-569-346-11	CONNECTOR, FPC (TRANSLATION) 10P			
		< CRYSTAL >			
X501	1-577-467-21	VIBRATOR, CRYSTAL (16MHz)			
X502	1-567-700-21	VIBRATOR, CRYSTAL (5.94755MHz)			

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Ref. No.	Part No.	Description			Remark
	* A-7071-369-A	SW-183 BOARD, COMPLETE ********************** (Ref. No 4,000 Series)			
		< CONNECTOR >			
CN930	* 1-566-761-11	PIN, CONNECTOR (PC BOARD) 6P			
CN931	1-575-846-11	CONNECTOR, FPC (NON ZIF) 6P			
		< DIODE >			
D900	8-719-977-34	DIODE DTZ12			
D901	8-719-977-34	DIODE DTZ12			
D902	8-719-404-46	DIODE MA110			
D903	8-719-977-34	DIODE DTZ12			
D905	8-719-404-46	DIODE MA110			
D906	8-719-404-46	DIODE MA110			
D907	8-719-404-46	DIODE MA110			
D908	8-719-976-97	DIODE DTZ5.1			
		< JACK >			
J900	1-507-929-41	JACK			
J901	1-565-276-21	JACK, ULTRA SMALL 1P			
		< COIL >			
L900	1-410-369-11	INDUCTOR CHIP 1uH			
L901	1-410-369-11	INDUCTOR CHIP 1uH			
L903	1-410-192-51	INDUCTOR CHIP 1uH			
L904	1-410-369-11	INDUCTOR CHIP 1uH			
		< TRANSISTOR >			
Q900	8-729-901-01	TRANSISTOR DTC144EK			
Q901	8-729-902-XX	TRANSISTOR DTC114TK			
		< RESISTOR >			
R900	1-216-073-00	METAL CHIP	10K	5%	1/10W
R901	1-216-073-00	METAL CHIP	10K	5%	1/10W
R902	1-216-295-00	METAL CHIP			
R915	1-216-296-00	METAL CHIP			
		< SWITCH >			
S900	1-570-870-11	SWITCH, SLIDE (STANDBY-LOCK)			
S901	1-571-838-11	SWITCH, TACTIL (START/STOP)			

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Ref. No.	Part No.	Description	Remark
	* A-7062-124-A	VF-26 BOARD, COMPLETE *********************	
		(Ref. No 6,000 Series)	
	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
	1-575-846-11	CONNECTOR, FPC (NON ZIF) 6P	
		< CAPACITOR >	
C901	1-126-369-11	ELECT 220uF 20% 6.3V	
C902	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C904	1-127-515-11	ELECT(SOLID) 47uF 20% 6.3V	
C905	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C906	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C907	⚠· 1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C908	⚠· 1-164-182-11	CERAMIC CHIP 0.0033uF 10% 50V	
C909	1-126-193-11	ELECT 1uF 20% 50V	
C911	1-131-388-00	TANTAL 68uF 10% 6.3V	
C912	1-102-038-00	CERAMIC 0.001uF	
C913	1-163-033-00	CERAMIC CHIP 0.022uF 50V	
C915	1-126-193-11	ELECT 1uF 20% 50V	
C916	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	(TYPE1)
C916	1-163-145-00	CERAMIC CHIP 0.0015uF 5% 50V	(TYPE2)
C916	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	(TYPE1)
C917	1-135-162-21	TANTALUM CHIP 33uF 20% 6.3V	(TYPE2)
C917	1-135-166-21	TANTALUM CHIP 47uF 10% 10V	(TYPE1)
C918	1-162-638-11	CERAMIC CHIP 1uF 16V	
C919	1-135-070-00	TANTALUM CHIP 0.1uF 10% 35V	
C920	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
		< CONNECTOR >	
CN901	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN902	* 1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN904	1-575-846-11	CONNECTOR, FPC (NON ZIF) 6P	
		< CONPOSITION CIRCUIT BLOCK >	
CP901	1-238-119-11	RES, ADJ	
		< SOCKET >	
CRT901	1-526-978-21	SOCKET ASSY, CRT	
		< DIODE >	
D903	8-719-400-20	DIODE MA152WA	
D955	8-719-404-19	DIODE LN1251C	
		< IC >	
IC901	8-759-420-01	IC AN2512S-T1	(TYPE1)
IC901	8-759-511-01	IC BA7147F	(TYPE2)
		< COIL >	
L901	1-410-645-31	INDUCTOR 100uH	
L902	1-410-385-11	INDUCTOR CHIP 22uH	
L903	⚠· 1-459-858-11	COIL, FERRITE (HLC)	
		< TRANSISTOR >	
Q902	⚠· 8-729-402-31	TRANSISTOR 2SD1819A	
Q903	8-729-106-68	TRANSISTOR 2SD1615A	
Q904	8-729-216-31	TRANSISTOR 2SA1163G	
		< RESISTOR >	
R902	⚠· 1-216-051-00	METAL CHIP 1.2K 5% 1/10W	(TYPE1)
R903	1-216-041-00	METAL CHIP 470 5% 1/10W	
R904	⚠· 1-216-073-00	METAL CHIP 10K 5% 1/10W	
R906	⚠· 1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R907	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R908	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R909	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R911	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R914	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R915	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R916	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R917	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R919	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R920	1-216-111-00	METAL CHIP 390K 5% 1/10W	(TYPE2)
R920	1-216-113-00	METAL CHIP 470K 5% 1/10W	(TYPE1)
R921	1-216-011-00	METAL CHIP 27 5% 1/10W	(TYPE2)
R921	1-216-013-00	METAL CHIP 33 5% 1/10W	(TYPE1)
R922	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R923	1-216-025-00	METAL CHIP 100 5% 1/10W	
R924	1-216-306-11	METAL CHIP 3.9 5% 1/10W	
R925	1-216-334-11	METAL CHIP 22K 1% 1/10W	(TYPE2)
R925	1-216-336-11	METAL CHIP 47K 1% 1/10W	(TYPE1)
R926	1-218-091-00	METAL CHIP 56K 1% 1/10W	(TYPE2)
R926	1-218-163-11	METAL CHIP 120K 1% 1/10W	(TYPE1)
R928	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R929	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	(TYPE1)
R929	1-216-073-00	METAL CHIP 10K 5% 1/10W	(TYPE2)
R930	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R931	1-216-121-00	METAL CHIP 1M 5% 1/10W	(TYPE1)
R950	1-216-041-00	METAL CHIP 470 5% 1/10W	
R951	1-216-295-00	METAL CHIP 0	
		< VARIABLE RESISTOR >	
RV901	1-238-647-11	RES, ADJ, METAL GLAZE 4.7M	

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.		Part No.	Description	Remark
			< TRANSFORMER >	
T901	⚠·	1-439-428-11	TRANSFORMER ASSY, FLYBACK	
			< THERMISTOR >	
TH901		1-807-938-11	THERMISTOR	

****

* A-7062-125-A VF-27 BOARD, COMPLETE
****
(Ref. No 7,000 Series)

Ref. No.		Part No.	Description	Remark
			< CAPACITOR >	
C901		1-124-442-00	ELECT 330uF 20% 6.3V	
C903		1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C904		1-126-160-11	ELECT 1uF 20% 50V	
C905		1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C906		1-131-381-00	TANTALUM 47uF 10% 10V	
C907		1-162-638-11	CERAMIC CHIP 1uF 16V	
C908		1-136-165-00	FILM 0.1uF 5% 50V	
C909		1-163-109-00	CERAMIC CHIP 47PF 5% 50V	
C910		1-124-587-11	ELECT 220uF 20% 6.3V	
C911		1-163-141-00	CERAMIC CHIP 0.001uF 5% 50V	
C912	⚠·	1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C913	⚠·	1-162-625-11	CERAMIC CHIP 0.0047uF 5% 50V	
C914	⚠·	1-163-209-00	CERAMIC CHIP 0.0015uF 5% 50V	
C915		1-126-090-11	ELECT 82uF 20% 10V	
C916		1-126-163-11	ELECT 4.7uF 20% 50V	
C918		1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C919		1-102-038-00	CERAMIC 0.001uF	
			< CONNECTOR >	
CN902	*	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN903	*	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
CN904		1-575-846-11	CONNECTOR, FPC (NON ZIF) 6P	
			< DIODE >	
D903		8-719-400-20	DIODE MA152WA	
D955		8-719-404-19	DIODE LN1251C	
			< IC >	
IC901		8-759-420-01	IC AN2512S	
			< COIL >	
L901		1-410-831-21	INDUCTOR 82uH	
L902		1-408-977-21	INDUCTOR 39uH	
L903	⚠·	1-459-858-11	COIL, FERRITE (HLC)	
			< TRANSISTOR >	
Q902	⚠·	8-729-100-66	TRANSISTOR 2SC1623	
Q903		8-729-216-31	TRANSISTOR 2SA1163	
Q904		8-729-100-66	TRANSISTOR 2SC1623	
Q905		8-729-106-68	TRANSISTOR 2SD1615A	
			< RESISTOR >	
R901	⚠·	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R903		1-216-041-00	METAL CHIP 470 5% 1/10W	
R904	⚠·	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R905		1-216-007-00	METAL CHIP 18 5% 1/10W	
R906		1-216-121-00	METAL CHIP 1M 5% 1/10W	
R908		1-216-097-00	METAL CHIP 100K 5% 1/10W	
R909		1-216-113-00	METAL CHIP 470K 5% 1/10W	
R910		1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R911		1-216-013-00	METAL CHIP 33 5% 1/10W	
R912		1-216-691-11	METAL CHIP 47K 0.5% 1/10W	
R913		1-218-163-11	METAL CHIP 120K 1% 1/10W	
R914		1-216-025-00	METAL CHIP 100 5% 1/10W	
R915		1-216-306-11	METAL CHIP 3.9 5% 1/10W	
R917		1-216-045-00	METAL CHIP 680 5% 1/10W	
R918		1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R919		1-216-748-11	METAL CHIP 39K 5% 1/10W	
R920		1-216-748-11	METAL CHIP 39K 5% 1/10W	
R921		1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R922		1-216-101-00	METAL CHIP 150K 5% 1/10W	
R923		1-216-121-00	METAL CHIP 1M 5% 1/10W	
R924		1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R925		1-216-131-11	METAL CHIP 2.7M 5% 1/10W	
R926		1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R928		1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R933		1-216-121-00	METAL CHIP 1M 5% 1/10W	
R950		1-216-041-00	METAL CHIP 470 5% 1/10W	
			< VARIABLE RESISTOR >	
RV901		1-230-873-11	RES, ADJ, METAL 47K	
RV902		1-230-866-11	RES, ADJ, METAL 470	
RV903		1-230-869-11	RES, ADJ, METAL 4.7K	
RV904		1-228-762-00	RES, ADJ, METAL GLAZE 1M	
			< TRANSFORMER >	
T901	⚠·	1-439-431-11	TRANSFORMER ASSY, FLYBACK	
			< THERMISTOR >	
TH901		1-807-938-11	THERMISTOR	

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

< SOCKET >

Ref. No.	Part No.	Description	Remark
W901	1-540-019-21	SOCKET ASSY, CRT	

****

* A-7071-341-A VK-14 BOARD, COMPLETE
****
(Ref. No 5,000 Series)

< DIODE >

Ref. No.	Part No.	Description	Remark
D508	8-719-420-33	DIODE MA151K	
D509	8-719-940-45	DIODE DWA010	
D516	8-719-977-34	DIODE DTZ12	
D517	8-719-977-34	DIODE DTZ12	
D518	8-719-977-34	DIODE DTZ12	
D519	8-719-977-34	DIODE DTZ12	
D521	8-719-977-34	DIODE DTZ12	
D522	8-719-977-34	DIODE DTZ12	
D523	8-719-977-34	DIODE DTZ12	
D524	8-719-977-34	DIODE DTZ12	
D526	8-719-977-34	DIODE DTZ12	
D527	8-719-977-34	DIODE DTZ12	
D528	8-719-977-34	DIODE DTZ12	
D530	8-719-404-46	DIODE MA110	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R502	1-216-029-00	METAL CHIP 150 5% 1/10W	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S500	1-571-787-11	SWITCH, TACTILE (REW)	
S503	1-571-787-11	SWITCH, TACTILE (FF)	
S504	1-571-787-11	SWITCH, TACTILE (STOP)	
S505	1-571-787-11	SWITCH, TACTILE (PAUSE)	
S506	1-571-787-11	SWITCH, TACTILE (TIME (NEXT))	
S507	1-571-787-11	SWITCH, TACTILE (DATE (+))	
S508	1-571-787-11	SWITCH, TACTILE (DATE SCREEN)	
S509	1-571-787-11	SWITCH, TACTILE (AGE/EVENT)	
S510	1-572-284-11	SWITCH, SLIDE (REC)	
S511	1-570-870-11	SWITCH, SLIDE (EDIT)	
S512	1-571-787-11	SWITCH, TACTILE (FRAME)	
S513	1-571-787-11	SWITCH, TACTILE (SLOW)	
S514	1-572-283-11	SWITCH, SLIDE (POWER)	
S515	1-571-787-11	SWITCH, TACTILE (ZERO MEM)	
S516	1-571-787-11	SWITCH, TACTILE (COUNTER RESET)	
S520	1-571-787-11	SWITCH, TACTILE (PB)	
S521	1-570-870-11	SWITCH, SLIDE (BEEP)	

< FLEXIBLE BOARD >

Ref. No.	Part No.	Description	Remark
W550	1-633-983-11	FP-296 FLEXIBLE BOARD	
W551	1-633-980-11	FP-308 FLEXIBLE BOARD	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
	1-569-286-11	CONNECTOR, CARDEDGE 5P (on the FP-249)	
71	1-542-125-21	MICROPHONE (C-2027)	
163	1-808-505-12	SENSOR (DEW)	
318	8-741-101-12	IC SBX1509-41	
319	1-529-096-11	BUZZER, PIEZOELECTRIC	
322	1-569-347-11	CONNECTOR, FPC (TRANSLATION) 13P	
353	1-547-357-12	FILTER BLOCK, OPTICAL	
364 ⚠	1-466-230-21	CONVERTER UNIT, D/D	
401	1-547-422-11	LENS, ZOOM (VCL-8508XE)	
451	1-547-412-14	LENS, ZOOM (VCL-8508XF)	
IC101	8-752-604-98	IC ICX026CK-2 (CCD IMAGER) (Note 1)	
L901 ⚠	1-451-310-21	DEFLECTION YOKE (B/W)	
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING	
S901	1-572-286-11	SWITCH, PUSH (ZOOM)	
S903	1-571-099-11	SWITCH	
V901-1⚠	1-546-085-11	CATHODE-RAY TUBE, B/W (M01KGG007WB)	
V901-2⚠	1-452-482-11	CRT ASSY (M91JYZ60WB)	

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Note 1)	For replacement of CCD imager, CD-58 board, complete and DT-77 board, complete read carefully the CAUTIONS FOR REPLACEMENT OF CCD IMAGER on page 95.

Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIAL	
		****************************	
	1-465-395-41	COMMANDER, REMOTE (RMT-502)	
	* 3-340-514-01	BAG, PROTECTION	
	* 3-744-867-01	CUSHION (UPPER)	
	* 3-744-868-01	CUSHION (LOWER)	
	3-752-999-22	MANUAL, INSTRUCTION (F401) (ENGLISH)	
	3-752-999-31	MANUAL, INSTRUCTION (F401, CND) (FRENCH)	
	3-753-229-21	MANUAL, INSTRUCTION (F402) (ENGLISH)	
	* 3-795-581-21	SAFEGUARD (SONY), IMPORTANT (F401/F402, US)	
	* 3-941-633-01	CATALOGUE, GV, DECK ACCESSORY (F401/F402, US)	
		**** ACCESSORY & PACKING MATERIAL (KIT) ****	
		**********************************	
	* 3-741-532-01	CUSHION, ACC	
	* 3-744-971-41	INDIVIDUAL CARTON (F401)	
	3-941-737-01	BELT, SHOULDER	
	* 3-942-596-01	INDIVIDUAL CARTON (F402)	
**	AC-V60/60A	AC POWER ADAPTOR	
***	NP-66H	BATTERY PACK	
***	RFU-90UC	RFU ADAPTOR	

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

****

HARDWARE LIST

# 1	7-621-281-15	SCREW +P 2X2
# 2	7-627-553-48	PRECISION SCREW +P 2X4 TYPE 3
# 3	7-627-553-68	SCREW, PRECISION +P 2X6 TYPE3
# 4	7-671-155-01	STEEL BALL 3.0
# 5	7-627-555-88	SCREW (M1.4X1.8)
# 6	7-627-553-37	SCREW (M2X3), SPECIAL HEAD

****

SECTION 7
SERVICE MODE

☆This unit adopts the camera adjustment and the EVR (Electronic Variable resistor) with the SENSER LANC system.

7-1. SENSER LANC

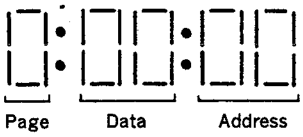
SENSER LANC is the LANC format to adjust the EVR (Electronic Variable resistor) of Video 8 Handycam and to perform tests by using the LANC (control L). This word stands for the same as the SERVICE LANC formerly used, however, the unified word "SENSER LANC" will be used with this substantial functions.

7-1-1. How to Use RM-95 jig (remote control for adjustment)

RM-95 jig is used to operate the SENSER LANC. HOLD switch of this jig is remodelled for service to get the SENSER LANC mode. Replacing microcomputer in RM-95 is required for the old-model RM-95 jig, which has no page display function.

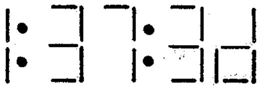
Old model	μPD7503G-A71-12 μPD7503G-C23-12	8-759-142-56 8-759-146-77	Page is not displayed (Replacing microcomputer is required)
New model	μPD7503G-C56-12	8-759-148-35	Page is displayed

LCD display of RM-95



⇨

Example



This means that the page 1 and address 3D is data of 37.

- Reference between Data and Bit

When the data is 37 ⇨ Bit

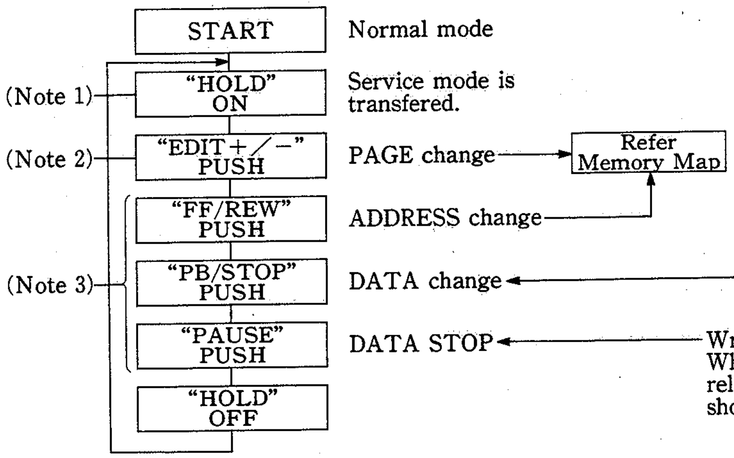
3					7			
7	6	5	4		3	2	1	0
0	0	1	1		0	1	1	1

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE
		0	0	1	1	0	1	1	1

The data in the above list means as follows:

ME SW ....ON
REC PROOF SW ....ON
AUDIO MUTE ......ON
JOG..................ON
VA PB MODE........ON

7-1-2. Tansfer method of the service mode with RM-95


START
Normal mode
(Note 1)
"HOLD" ON
Service mode is transfered.
(Note 2)
"EDIT+/−" PUSH
PAGE change
Refer Memory Map
"FF/REW" PUSH
ADDRESS change
(Note 3)
"PB/STOP" PUSH
DATA change
"PAUSE" PUSH
DATA STOP
"HOLD" OFF

LCD display
(HEX model)
P : DD : AA
(F : 00 : 00)

Data display
Set address data is displayed. The page input first from the normal condition is set to 0.

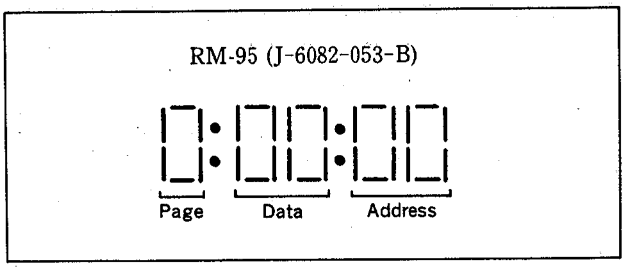
P : 00 : 00 When selecting the page not being built-in, the data value set previously becomes indefinite. When modifying in the built-in page, the address is not changed.

P : DD : AA

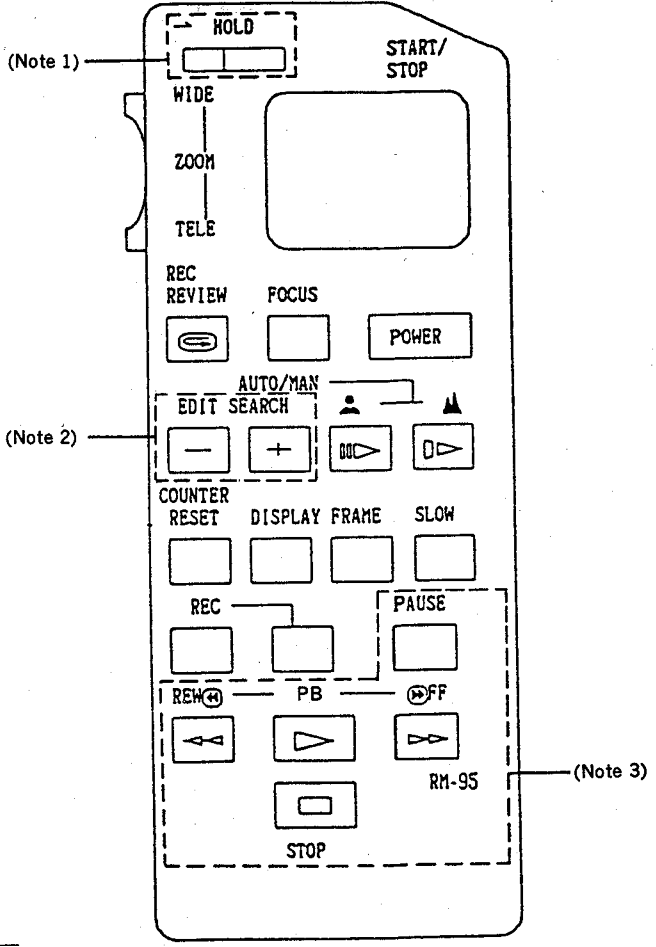
<When ADJ data is modified>
EVR value (RAM) is updated to the modified data. (It is not written into EE PROM)

Write into EE PROM.
When writing into EE PROM, WRITE PROTECT should be released. When releasing, data of page 1 and address 00 should be set to 01 first.

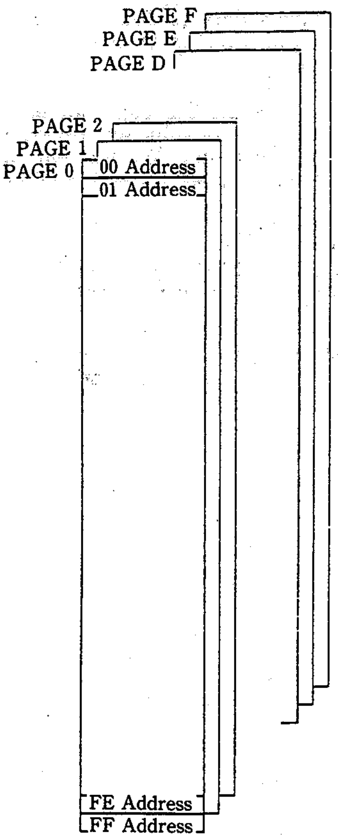
Command name	Command function	Function Button with RM-95
Page Up	Page+1	Edit Search+
Page Down	Page−1	Edit Search−
Direct Page Set	Set to direct page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address−1	Rewind
Data Up	Data+1	Play Back
Data Down	Data−1	Stop
Store	Write data into EEPROM, RAM	Pause


RM-95 (J-6082-053-B)
0:00:00
Page
Data
Address

RM-95 (J-6082-053-B)


HOLD
(Note 1)
START/STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
AUTO/MAN
EDIT SEARCH
(Note 2)
COUNTER RESET
DISPLAY
FRAME
SLOW
REC
PAUSE
REW
PB
FF
RM-95
(Note 3)
STOP

7-1-3. SENSER LANC Memory Map



PAGE	Page allocation	Description
0	Service	
1	Mode Control RAM	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2	Mode Control I/O	
3	Mechanical Control RAM	RAM and I/O memory area of the mechanical controller.
4	Mode Control I/O	
5	Camera microcompuler RAM	RAM and I/O memory area of the camera micro controller.
6	Camera microcompuler I/O	
7	Spare	
8	Spare	
9	Spare	
A	Spare	
B	Spare	
C	Spare	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is tuned off. Releasing protect is required for changing data.
E	Camera EE-PROM2	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is tuned off.
F	Camera EE-PROM1	

Note) There are 16 types of page from 0~F. The allocation of page is as the above list. Only the memory of page D, E and F is not erased when the power is turned off as the EVR (Electronic Variable resistor).

7-1-4. Types of Self-diagnostic Feature

This unit has ADJUST mode and TEST mode as follows:

MODE		Contents
ADJUST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
TEST	Pass adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergency is not detected except for TOP/END detection of the TAPE.
	Read of emergency code	The following functions are added to the emergency display function currently in use. ①The lithium battery is not required because to memorize into EE-PROM is allowed. ②The first emergency and the last emergency are memorized. ③The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D selecting, and the A/D selecting value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

7-1-5. How to use practically

How to use:

How to set the adjustment mode and the TEST mode

Set RM-95 to the service mode. (HOLD SW "ON")

How to change and write data

Press the PAUSE button of RM-95. Pressing PAUSE button is not required for some RAM and I/O area.

Change and write data of EE-PROM

Removing PROTECT is required. The PROTECT is removed by setting as follows:

PAGE 1	Address 00	Data 01

But CAMERA system don't need release, because don't set PROTECT.

How to release each mode

Releasing from EE-PROM area	Be sure to return the data of PAGE 1 address 00 to 00 from 01, and then turn off the service mode of RM-95.
Releasing from RAM and I/O area	Turn off the service mode or turn off the power, because hoding of data is not required.

- In order to perform the pass track shift......Refer to page 195.
- In order to inhibit the emergency detection......Refer to the list in page 236.
- In order to check the emergency code......Refer to page 237.
- In order to operate the motor singly......Refer to page 240.
- In order to check the function switch......Refer to page 239.
- In order to check the mechanical switch......Refer to page 238.
- In order to read the A/D selecting value......Refer to page 240.
- In order to check the reception contents of the wireless remote control......Refer to page 240.

SECTION 8
MECHANICAL ADJUSTMENTS

For Mechanical Adjustments

Refer to mechanical adjustment (8 mm Video MECHANICAL ADJUSTMENT MANUAL III) manual for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-972-732-11)

For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

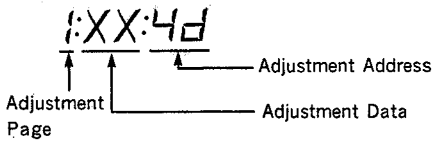
[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Press EDIT SEARCH + button once, and select page 1.
3) Select the adjustment address 4D with FF or REW button.
4) Set to 3X with PLAY and STOP button. (Setting of track shift mode)

Note: 3X should be the number from 31 to 3F. (To display "3X" with PLAY and STOP button is simple to shift.)

(When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)

5) Set to the HOLD OFF side in order to set the normal mode.



(1X : TEST 1
2X : TEST 2 ('CH Playback)
3X : TEST 3 (Shift mode)
4X : Shift release)

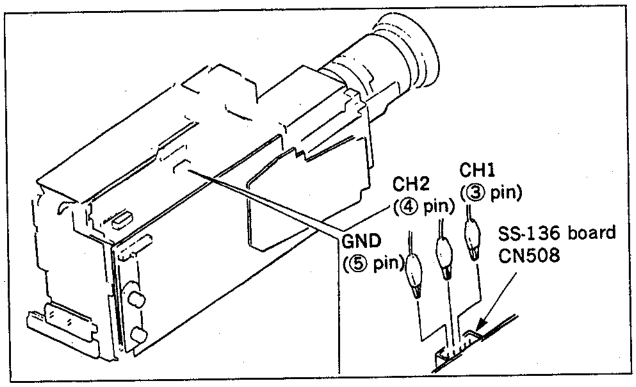


Fig. 8-1.

8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guide, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1 : SS-136 board CN508 pin ③ (PB RF)
   CH2 : SS-136 board CN508 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1NP) (8-967-995-02).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. When not flat, make adjustment as follows. (Refer to Figs. 8-1 and 8-2.)

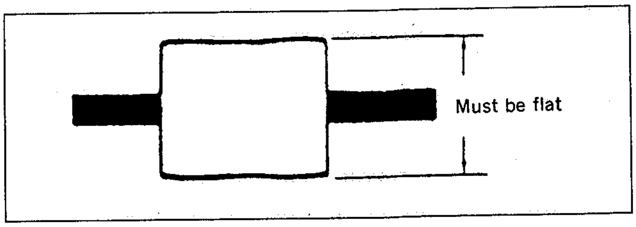


Fig. 8-2.

SECTION 9
CAMERA ADJUSTMENTS

PREPARATION FOR ADJUSTMENT (CAMERA BLOCK)

9-1. LIST OF SERVICING JIGS

- Oscilloscope
- Stabilized power supply (2 units)
- Adjusting screwdriver
- L lench
- Stop watch
- Color monitor TV
- Vectorscope
- Desk-top calculator

Ref. No.	Name	Part No.	Use
J-1	Filter (C14)	J-6080-054-A	Auto white balance adjustment
J-2	ND filter 0.1	J-6080-807-A	
	ND filter 0.3	J-6080-818-A	
	ND filter 0.4	J-6080-806-A	
	ND filter 0.9	J-6080-833-A	
	ND filter 1.0	J-6080-808-A	
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color bar chart for pattern box	J-6020-250-A	
J-5	Extension cable (5P)	J-6082-043-A	To connect VC-94 board CN304 and DC-DC converter
	Extension cable (4P)	J-6082-042-A	To connect VC-94 board CN307 and VA-67 board W701
J-6	Extension cable (20P)	J-6082-063-B	To connect VA-67 board CN703 and CT-38 board CN705
J-7	Extension cable (12P)	J-6082-056-A	To connect VC-94 board CN305 and VA-67 board W702
J-8	Camera fixing jig	J-6080-894-A	
J-9	Siemens-star chart Transmission type simens-star chart	J-6080-875-A J-6080-923-A	Either of the siemens-star charts which appear during adjustment may be used.
J-10	Adjustment remote control＊1	J-6082-053-B	
J-11	AF microcomputer data reader jig ＊2	J-6082-025-A	
J-12	CPA connector jig	J-6082-109-A	

＊1 Microcomputer IC in the adjustment Remote controller except for μPD7503G-C56-12 (8-759-148-35) does not allow the page selecting. Replace the microcomputer in such a case.

＊2 Change the fixed number of R1 from 10kΩ to 100kΩ in the AF microcomputer data reading jig. (If the number is kept to 10kΩ, the adjustment data can not change because of the difference of of the impedance.)
When adjustment the old-model Handy Cam, 100kΩ is allowed to perform the adustment.

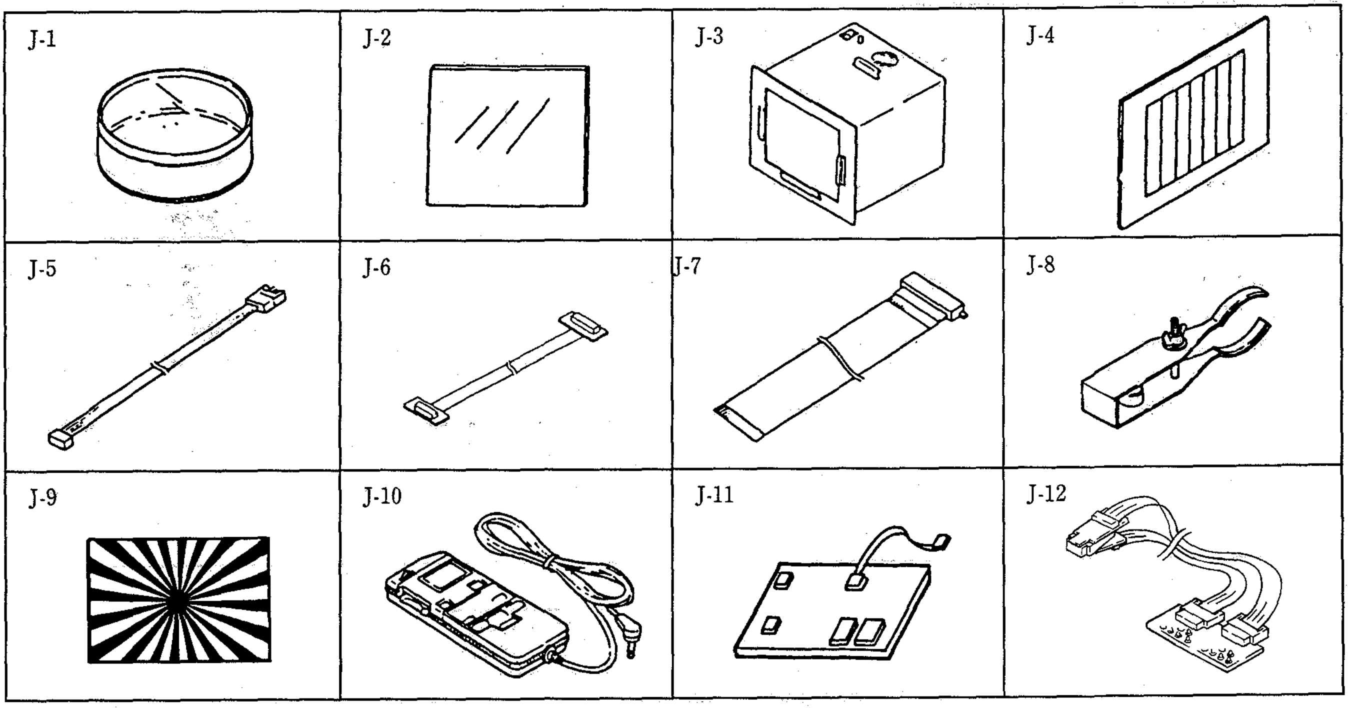

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11
J-12

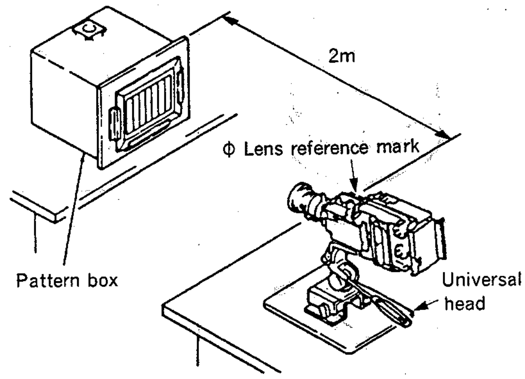
Fig. 9-1.

9-2. PREPARATION FOR ADJUSTMENT

9-2-1. Preparation

Note : Refer to "SECTION 2. DISASSEMBLY" for details of the cabinet and individual boards removal procedure.

1) Connect the camera block and the video block by using the extension cable, and other equipment as shown in Fig. 9-3.
2) EVF (Electrical View Finder) section VF-26 or VF-27 boards is necessary for confirmation of shutter speed, white balance mode and etc.
   If not necessary, it can removed by taking out CN931 on the SW-183 board.
3) MIC board (MC-76 board) is not necessary. Remove it by taking out W651 on the MC-76 board.


2m
Φ Lens reference mark
Pattern box
Universal head

When the camera block and the video block are separated with the cabinet removed, fix by using the camera fixing jig.

Fig. 9-2.

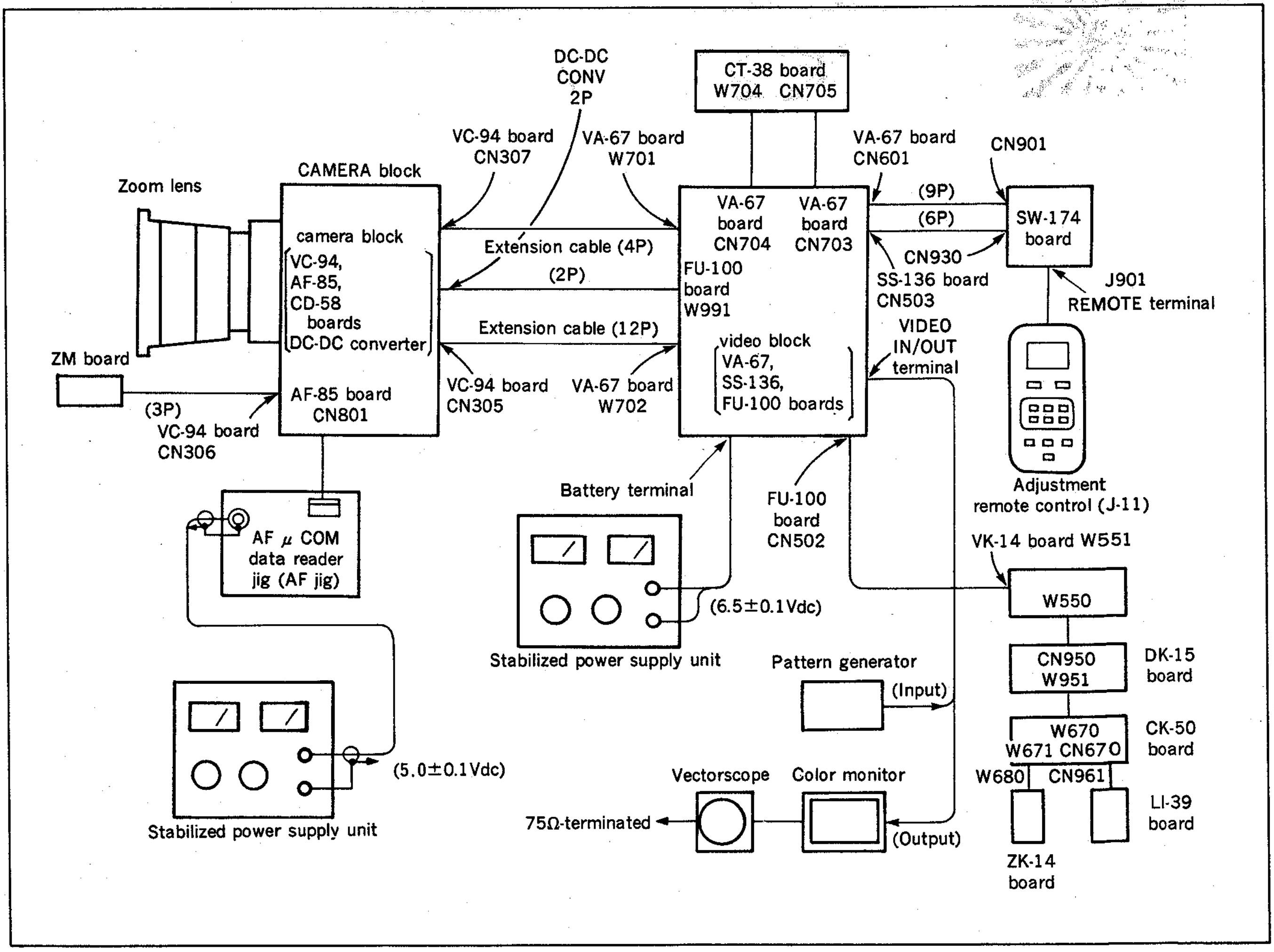

DC-DC CONV 2P
CT-38 board W704 CN705
VC-94 board CN307
VA-67 board W701
VA-67 board CN601
CN901
Zoom lens
CAMERA block
camera block
VC-94, AF-85, CD-58 boards
DC-DC converter
Extension cable (4P)
(2P)
Extension cable (12P)
VA-67 board CN704
VA-67 board CN703
FU-100 board W991
video block
VA-67, SS-136, FU-100 boards
(9P)
(6P)
SW-174 board
CN930
SS-136 board CN503
VIDEO IN/OUT terminal
J901
REMOTE terminal
ZM board
(3P)
VC-94 board CN306
AF-85 board CN801
VC-94 board CN305
VA-67 board W702
Battery terminal
FU-100 board CN502
Adjustment remote control (J-11)
VK-14 board W551
AF μ COM data reader jig (AF jig)
(6.5±0.1Vdc)
Stabilized power supply unit
W550
CN950 W951
DK-15 board
Pattern generator
(Input)
W670
W671 CN670
CK-50 board
(5.0±0.1Vdc)
Vectorscope
Color monitor
W680
CN961
LI-39 board
Stabilized power supply unit
75Ω-terminated
(Output)
ZK-14 board

Fig. 9-3.

9-2-2. Caution

1) Setting of switches
   Unless otherwise specified, set the switches to the following position for making adjustments.
   1. AUTO LOCK switch
      ......Lock release position
   2. FOCUS button (S673 on CK-50 board)
      ......MANUAL mode
   3. WHITE BALANCE button (S676 on CK-50 board)
      ......INDOOR mode ("INDOOR" indication appears on EVF.)
   4. SHUTTER SPEED button (S671 on CK-50 board)
      ......NORMAL mode (No indications of "100" "2000", etc. appear on EVF.)
2) Adjustment order
   As a rule, adjust in described order.
3) Objects
   1. Color bar chart (standard picture frame)
      When making Adjustments by the use of a color bar chart, adjust the picture frame as shown in Fig. 9-4. (Standard picture frame)

Color Bar Chart Standard Picture Frame

☆ Basically, adjust the color bar chart standard picture frame with the under-scanning monitor as shown in Fig. a.

1) Place a black window with the horizontal width same as that of a color bar pattern, respectively on left and right sides of the screen. (A=B)
2) Put together lower ends of the color pattern and under-scanning monitor in the vertical direction.

Fig. a

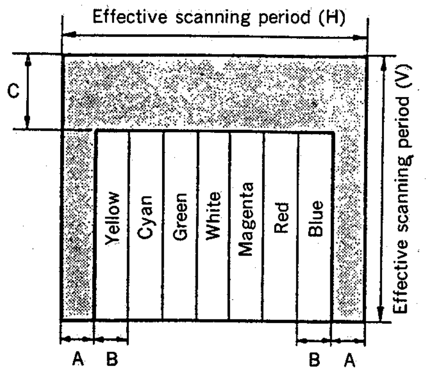
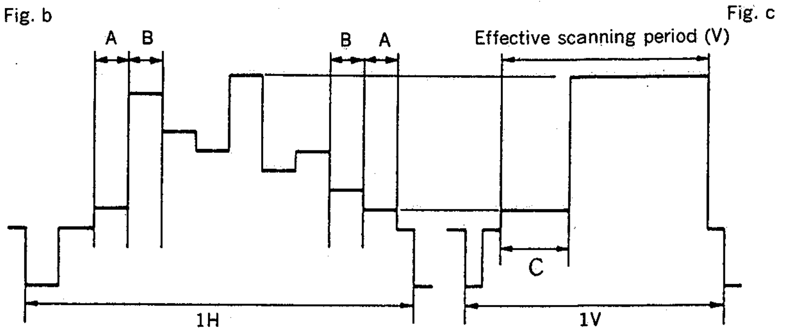

Effective scanning period (H)
C
Yellow
Cyan
Green
White
Magenta
Red
Blue
Effective scanning period (V)
A B
B A

Fig. b

Fig. c

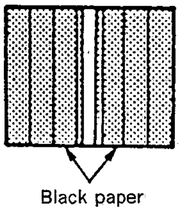

A B
B A
Effective scanning period (V)
C
1H
1V

● To photograph the color bar chart standard picture frame shown in Fig. a. adjust Output Y (CN307① on VC-94 board) as shown in Fig.b and c.

Fig. 9-4.

2. All white pattern
   Remove a color bar chart from the pattern box and set the zoom lever fully to the TELE side (68mm).
3. High luminance pattern
   Prepare a high luminance pattern as shown in Fig. 9-5 and adjust the picture frame as shown in Fig. 9-6.
4. Siements star
   orient a camera to have the siemens star center coincide with the monitor screen center on a monitor TV screen.

High luminance pattern


Black paper

Cover a color bar chart with black paper, except half the width of its white stripe. Then shoot the chart in this state.

Fig. 9-5.

High luminance pattern

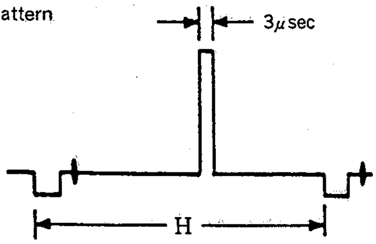


Fig. a (camera output waveform of CPA pin Ⓐ8 on VC-94 board)

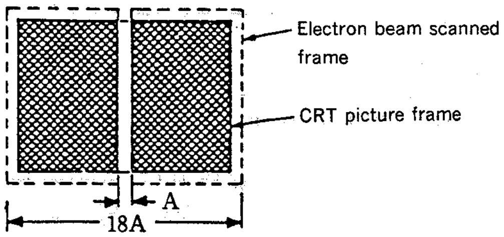

Electron beam scanned frame
CRT picture frame
A
18A

Fig. b (Picture of monitor TV screen)

By operating the camera zooming and orientation have the Fig. a output waveform output and the Fig. b monitor TV image displayed.

Fig. 9-6.

9-2-3. Adjustment Remote Control

In the camera block, the EVR (Electronic Variable Resistor) is used as an adjustment element in place of a conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microcomputer (VC-94 board IC501). This microcomputer reads the data written in the non-volatile memory inside the microcomputer and sends it to the EVR. The EVR generates an adjustment voltage by D-A conversion of this data (8 bits per one adjustment point).

To adjust, the camera block, therefore, it is necessary to rewrite the adjustment data written in the non-volatile memory. The adjustment remote control is used for this purpose. The adjustment remote control performs bidirectional communications with the microcomputer in the camera block through a remote control signal line (LANC). UP/DOWN commands for adjustment page, address and data are sent from the adjustment remote control to the microcomputer in the camera block. Sent from the microcomputer in the camera block to the adjustment remote control are the adjustment page, address and data.

Note: The microcomputer IC in the adjustment remote controller except for new microcomputer (μPD7503G-C56-12) dose not allow the adjustment page selecting. Replace with the new microcomputer (8-759-148-35) in such a case.

1. Using the Adjustment Remote Control

1) Connect the adjustment remote control to the REMOTE terminal (SW-174 board J901).
(Shift the HOLD switch of the adjustment remote control to the HOLD position (SERVICE position).)
2) Turn on the power for the main unit.
3) If the connection is correct, the following is displayed on the adjustment remote control LCD. (The adjustment data varies from one set to another.)

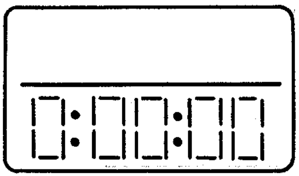


Fig. 9-7. (a)

4) Specify your desired adjustment page by the adjustment remote control.
Pressing the EDIT SEARCH (+) increments the adjustment page. Pressing the EDIT SEARCH (—) decrements it. The adjustment page is shown in the hexadecimal numbers and there are 16 of them from 1 to F. The CAMERA adjustment page is page F and Pressing the EDIT SEARCH (—) buttom one push.

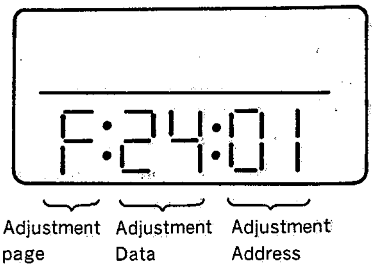


Fig. 9-7. (b)

5) Specify your desired adjustment address by the adjustment remote control. Pressing the FF (▶▶) button increments the adjustment address, and pressing the REW (◀◀) button decrements it.
(The adjustment address is shown in the decimal number and there are 256 of them from 00 to FF. The adjustment address corresponds to the output terminal of the EVR (IC301 on the VC-94 board, IC504 on the VC-94 board, and IC004 of the MX-10 board). Refer to Table 9-1 for adjustment of each address.)
6) Make adjustment by increasing/decreasing the adjustment data.
Pressing the PLAY (▶) button increases the adjustment data, and pressing the STOP (■) button decreases it.

- The adjustment data is shown in the hexadecimal number and assumes 256 kinds of values ranging from 00 to FF.

Hexadecimal No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication of LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal converted value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 9-1.

- The adjustment data corresponds to the output voltage of the EVR (IC301 on the VC-94 board, IC504 on the VC-94 board, and IC004 on the MX-10 board) as follows:
  MX-10 board IC004 : 2.0 ⟷ 5.0 Vdc
  VC-94 board IC301 : 0 ⟷ 5.0Vdc
  VC-94 board IC504 : 1.0 ⟷ 3.5Vdc

7) Change the adjustment address with the FF (▶▶) or REW (◀◀) button in order to store the adjustment data into the non-volatile memory built in the EVR/AWB microcomputer (VC-94 board IC501).
(If this operation is omitted, new adjustment data will not be stored into the non-volatile memory.)
8) There is a function provided to make note of the last error cuased by the COUNTER RESET button during operation of the set even if the power is turned off. This LAST MEMO EMERGENCY (last error) can be cleared.

2. Cautions for Using the Adjustment Remote Control

Erroneous operation of the adjustment remote control may delete correct adjustment data. To avoid this, it is recommended to make note of all the adjustment data before adjustment and of new adjustment data every time adjustment of one item is completed.

3. List of Adjustment Addresses

Use the adjustment page F for the camera part adjustment of this unit.

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
01	MX-10 board IC004 pin ⑱	R CONT	Auto white balance adjustment	
02	MX-10 board IC004 pin ⑲	B CONT		
03	MX-10 board IC004 pin ②	C_1 GAIN	Matrix (3) C_1 gain adjustment	
04	MX-10 board IC004 pin ③	B GAIN	Pre-white balance adjustment	
05	MX-10 board IC004 pin ④	R GAIN		
06	MX-10 board IC004 pin ⑤	Y_2 GAIN	Matrix (2) Y_2 gain adjustment	
07	MX-10 board IC004 pin ⑥	Y_1 GAIN	Matrix (1) Y_1 gain adjustment	
08	MX-10 board IC004 pin ⑦	Y_H GAIN	Y_H level adjustment	
09	MX-10 board IC004 pin ⑧	R-Y GAIN	Color reproducibility adjustment	
0A	MX-10 board IC004 pin ⑨	B-Y GAIN		
0B	MX-10 board IC004 pin ⑫	R-Y HUE		
0C	MX-10 board IC004 pin ⑬	B-Y HUE		
0D	VC-94 board IC301 pin ⑱	SHP LEVEL	H aperture Adjustment	
0E	VC-94 board IC301 pin ⑲	Y LEVEL	White clip, Y level adjustments	
0F	VC-94 board IC301 pin ②	VAP GAIN		
10	VC-94 board IC301 pin ③	SET UP	Set up adjustment	
11	VC-94 board IC301 pin ④	C LEVEL	Chroma level adjustment	
12	VC-94 board IC301 pin ⑤	V SUB CONT	V sub adjustment	
13	VC-94 board IC301 pin ⑥	PG CONT	PG cont adjustment	
14	VC-94 board IC301 pin ⑦	$Y\gamma$ CONT		
15	VC-94 board IC301 pin ⑧	WHITE CLIP	White clip adjustment	
16	VC-94 board IC301 pin ⑨	SYNC LEVEL	Sync level adjustment	
17	VC-94 board IC301 pin ⑫	BURST LEVEL	Burst level adjustment	
18	VC-94 board IC301 pin ⑬	MAX GAIN	Set up, Max gain adjustments	
19	VC-94 board IC504 pin ⑱	IRIS REF	Iris adjustment	
1A	VC-94 board IC504 pin ⑲	AGC REF	AGC adjustment	
1B	VC-94 board IC504 pin ②	HALL GAIN	Hall adjustment	
1C	VC-94 board IC504 pin ③	HALL OFFSET		
1D	VC-94 board IC504 pin ④	FADER LEVEL		
1E	VC-94 board IC504 pin ⑤	—		
1F	VC-94 board IC504 pin ⑥	FADER CONT		
20	VC-94 board IC504 pin ⑦	FOCUS SPEED		
21	VC-94 board IC504 pin ⑧	ZOOM SPEED		
22	VC-94 board IC504 pin ⑨	M IRIS CONT	Not used	
23	VC-94 board IC504 pin ⑫	M AGC CONT		
24	VC-94 board IC504 pin ⑬	AGC IN PULSE		

Table 9-2 (1)

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
25		AGC LD REF		
26		AGC MD	AF adjustment	
27		AGC HD		
28		LD-B		
29		HD-B		
2A		M SPEED-A	Focus motor speed adjustment	
2B		M SPEED-B		
2C		M SPEED-C		
2D		M SPEED-D		
2E		M SPEED-E		
2F		HOLD TIME		
30		PA SET	AF adjustment	
31		AGC LD TH		
32		HD TH1		
33		HD TH2		
34		ZOOM-POSI 1		
35		ZOOM-POSI 2		
36		ZOOM-POSI 3		
37		ZOOM-POSI 4		
38		ZOOM-POSI 5		
39		GETA MIN		
3A		GETA		
3B		BACK RUSH		
3C		MACRO TIME OUT		
3D		ZOOM-TAN-MASK		
3E		BACK RUSH ZOOM		
3F		IRIS L		
40		IRIS H		
41		MACRO END COUNT		
42		FILTER GAIN		
43		LD FILTER GAIN		
44		AGC LD BIAS		
45		AGC CONT W	AF adjustment	
46		AGC CONT B		

Table 9-2 (2).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
47		AGC LD GAIN		
48		SHIND STOP		
49		INV COUNT MAX		
4A		ADJ PWM	Focus motor speed adjustment	
4B		AGC COUNT TH		
4C		END COUNT THF		
4D		END COUNT THF		
4E		FDL GIKAI TH		
4F		FDN TH		
50		FDP TH		
51		HANTING ZONE		
52		M SPEED UP		
53		PA GIKAI TH		
54		————		
55		————		
56		————		
57		————		
58		ZOOM-SPEED 1		
59		ZOOM-SPEED 2		
5A		ZOOM-SPEED 3		
5B		ZOOM-SPEED 4		
5C		MAN PWM SPEED	Focus motor speed adjustment	
5D		MAN F SPEED		
5E		————		
5F		————		
60		IRIS REF-NOR	Standard AE level adjustment	
61		IRIS REF-PO		
62		IRIS REF-SP		
63		————		
64		————		
65		————		
66		————		
67		————		
68		————		
69		————		

Table 9-2 (3).

Adjust-ment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
6A		————		
6B		MAXSHUT-PO (H)		
6C		MAXSHUT-PO (L)		
6D		MAXSHUT-SP (H)		
6E		MAXSHUT-SP (L)		
6F		REF-WIDTH (H)		
70		REF-WIDTH (L)		
71		SHUT-MULTI (H)		
72		SHUT-MULTI (L)		
73		SHUT-COUNT 1		
74		SHUT STEP-MULTI		
75		IRIS OPEN		
76		REF-TURBO (H)		
77		REF-TURBO (L)		
78		TURBO-WIDTH (H)		
79		TURBO-WIDTH (L)		
7A		TURBO-TR (H)		
7B		TURBO-TR (L)		
7C		SHUT-COUNT 2		
7D		SHUT-COUNT 3		
7E		————		
7F		————		
80		USER R-Y GAIN		
81		USER B-Y GAIN		
82		USER B-Y HUE		
83		USER R-Y HUE		
84		USER SHP LEVEL		
85		USER Y LEVEL		
86		————		
87		————		
88		————		
89		————		
8A		————		
8B		————		
8C		————	Standard AE level adjustment	

Table 9-2 (4).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
8D		——		
8E		——		
8F		——		
90		R3200 MSB		
91		R3200 LSB		
92		B3200 MSB		
93		B3200 LSB		
94		G3200 MSB		
95		G3200 LSB		
96		SHUTTER IN	Shutter IN/OUT adjustment	
97		SHUTTER OUT		
98		START R	Auto white balance adjustment	
99		START B		
9A		R OUT DOOR		
9B		B OUT DOOR		
9C		——		
9D		——		
9E		——		
9F		——		
A0		Ra	Auto white balance adjustment	
A1		Rb		
A2		Rc		
A3		Ba		
A4		Bb		
A5		Bc		
A6		R/B TOP		
A7		R/B MDL		
A8		R/B BTM		
A9		B/R TOP		
AA		B/R MDL		
AB		B/R BTM		
AC		BTM SLP R		
AD		BTM SLP B		
AE		MDL SLP R		
AF		MDL SLP B		

Table 9-2 (5).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
B0		TOP SLP R	Auto white balance adjustment	
B1		TOP SLP B		
B2		KEIKO R		
B3		KEIKO B		
B4		BTM UP		
B5		BTM DWN		
B6		MDL UP		
B7		MDL DWN		
B8		TOP UP	Auto white balance adjustment	
B9		TOP DWN		
BA		KEIKO		
BB		KEIKO DWN		
BC		R TOP LMT		
BD		R DWN LMT	Auto white balance adjustment	
BE		B TOP LMT		
BF		B IN TOP		
C0		B IN MAX		
C1		B OUT MIN		
C2		B OUT DWN		
C3		B DWN LMT		
C4		LL LMT		
C5		TM DIVID		
C6		BM DIVID		
C7		DELAY TM		
C8		FAST TM		
C9		OUT HYS OFF		
CA		OUT B HYS		
CB		———		
CC		———		
CD		———		
CE		———		
CF		———		
D0		SYSTEM	NTSC/PAL select	
D1		———		
D2		———		

Table 9-2 (6).

<table>
<tr><th>Adjust-ment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>D3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>D9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DB</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DC</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DD</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DE</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>DF</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E0</td><td></td><td>DISPLAY MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment data.</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>DISPLAY MODE R, B, CONT</td></tr>
<tr><td>01</td><td>NEW R, B</td></tr>
<tr><td>02</td><td>R RATIO</td></tr>
<tr><td>03</td><td>B RATIO</td></tr>
<tr><td>04</td><td>R GAIN</td></tr>
<tr><td>05</td><td>B GAIN</td></tr>
<tr><td>06</td><td>RM DATA</td></tr>
<tr><td>07</td><td>GM DATA</td></tr>
<tr><td>08</td><td>BM DATA</td></tr>
<tr><td>09</td><td>NORM R</td></tr>
<tr><td>0A</td><td>NORM B</td></tr>
<tr><td>0B</td><td>R DATA</td></tr>
<tr><td>0C</td><td>G DATA</td></tr>
<tr><td>0D</td><td>B DATA</td></tr>
<tr><td>0E</td><td>R_1, B AIM</td></tr>
<tr><td>0F</td><td>ERROR</td></tr>
</table></td><td></td></tr>
<tr><td>E1</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E2</td><td></td><td>—</td><td></td><td></td></tr>
</table>

Table 9-2 (7).

<table>
<tr><th>Adjustment Address</th><th>Adjustment Voltage Output Terminal</th><th>Adjustment Item</th><th>Remarks</th><th>Memo Column</th></tr>
<tr><td>E3</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E4</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E5</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E6</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E7</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E8</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>E9</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EA</td><td></td><td>—</td><td></td><td></td></tr>
<tr><td>EB</td><td></td><td>MODE</td><td>The following adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>NORMAL</td></tr>
<tr><td>01</td><td>F-HANTING</td></tr>
<tr><td>03</td><td>ZOOM-POSI</td></tr>
<tr><td>05</td><td>IRIS-POSI</td></tr>
<tr><td>0B</td><td>AGC-CONT</td></tr>
<tr><td>11</td><td>SHUTTER IN/OUT</td></tr>
<tr><td>13</td><td>AE LEVEL</td></tr>
<tr><td>ED</td><td>FILTER-MD</td></tr>
<tr><td>EF</td><td>FILTER-HD</td></tr>
<tr><td>F1</td><td>FILTER-LD</td></tr>
<tr><td>F5</td><td>FP3 HANTING</td></tr>
</table></td><td></td></tr>
<tr><td>EC</td><td></td><td>AWB MODE 3</td><td></td><td></td></tr>
<tr><td>ED</td><td></td><td>AWB MODE 2</td><td></td><td></td></tr>
<tr><td>EE</td><td></td><td>AWB MODE 1</td><td>The following auto white balance adjustment mode is selected by changing the adjustment data.
<table>
<tr><th>Adjustment Data</th><th>Adjustment Mode</th></tr>
<tr><td>00</td><td>AWB MODE 1</td></tr>
<tr><td>10</td><td>WB DIRECT</td></tr>
<tr><td>F0</td><td>WB FREE</td></tr>
<tr><td>01</td><td>3200k Data fetch 1</td></tr>
<tr><td>23</td><td>3200k Data fetch 2</td></tr>
</table></td><td></td></tr>
</table>

Table 9-2 (8).

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Memo Column
EF		———		
F0		———		
F1		———		
F2		———		
F3		———		
F4		———		
F5		———		
F6		———		
F7		———		
F8		———		
F9		———		
FA		———		
FB		———		
FC		———		
FD		———		
FE		———		
FF		———		

Table 9-2 (9).

9-3-3. Camera DC-DC Converter Voltage Check (VC-94 Board/CD-58 Board)

Measuring isntrument	Digital voltmeter
15V check	
Measurement point	CN101 pin ① (CD-58 Board)
Specified value	$15.0\pm0.2V_{DC}$
−9V check	
Measurement point	CN101 pin ② (CD-58 Board)
Specified value	$-9.00\pm0.15V_{DC}$
4.9V check	
Measurement point	CN101 pin ③ (CD-58 Board)
Specified value	$4.9\pm0.1V_{DC}$
CAM 4.9V check	
Measurement point	CN304 pin ④ (VC-94 Board)
Specified value	$4.9\pm0.1V_{DC}$

[Checking Method]

1) Each supply voltage must meet the specified value.

9-3-4. EVR Initial Setting of adjustment page F

Set to the following initial settings of the adjustment data only when the CCD IMAGER was replaced.
Make initial setting of adjustment data when the EVR/AWB microcomputer is replaced.
(Pre-replacement microcomputer data will do.)

Adjustment Address	Adjustment Data Initial Value
0E (Y LEVEL)	9C
0F (VAP GAIN)	7A
12 (VSUB CONT)	3A
13 (PG CONT)	5A
14 (Yγ CONT)	AE
15 (WHITE CLIP)	FF
18 (MAX GAIN)	E0
19 (IRIS REF)	4C
1F (FADER CONT)	00
25 (AGC LD REF)	B0
26 (AGC MD)	A0
27 (AGC HD)	B0
28 (LD B)	30
29 (HD B)	0E
2F (HOLD TIME)	3C
30 (PA SET)	E5
31 (AGC LD TH)	A0
32 (HD TH1)	30
33 (HD TH2)	1E
34 (ZOOM-POSI 1)	0F
35 (ZOOM-POSI 2)	3C
36 (ZOOM-POSI 3)	6B
37 (ZOOM-POSI 4)	9A
38 (ZOOM-POSI 5)	CA
39 (GETA MIN)	05
3A (GETA)	10
3B (BACK RUSH)	05
3C (MACRO TIME OUT)	07
3D (ZOOM-TAN-MASK)	30
3E (BACK RUSH ZOOM)	0A
3F (IRIS L)	AC
40 (IRIS H)	C0
41 (MACRO END COUNT)	3C
42 (FILTER GAIN)	02
43 (LD FILTER GAIN)	06
44 (AGC LD BIAS)	80
45 (AGC COUNT W)	30
46 (AGC COUNT B)	FF
47 (AGC LD GAIN)	A4
48 (SHIND STOP)	20
49 (INV COUNT MAX)	10
4A (ADJ PWM)	FF
4B (AGC COUNT TH)	0A
4C (END COUNT THF)	2A
4D (END COUNT THN)	2A
4E (FDL GIKAI TH)	03
4F (FDN TH)	FD
50 (FDP TH)	03
51 (HANTING ZONE)	05
52 (M SPEED UP)	01
53 (PA GIKAI TH)	09
58 (ZOOM-SPEED 1)	20
59 (ZOOM-SPEED 2)	20
5A (ZOOM-SPEED 3)	50
5B (ZOOM-SPEED 4)	53
5D (MAN F SPEED)	30

Adjustment Address	Adjustment Data Initial Value
60 (IRIS REF NOR)	60
61 (IRIS REF PO)	60
62 (IRIS REF SP)	60
6B (MAX SHUT-PO (H))	01
6C (MAX SHUT-PO (L))	00
6D (MAX SHUT-SP (H))	01
6E (MAX SHUT-SP (L))	18
6F (REF-WIDTH (H))	01
70 (REF-WIDTH (L))	00
71 (SHUT-MULTI (H))	06
72 (SHUT-MULTI (L))	00
73 (SHUT-COUNT 1)	06
74 (SHUT STEP-MULTI)	01
75 (IRIS-OPEN)	20
76 (REF-TURBO (H))	06
77 (REF-TURBO (L))	00
78 (TURBO-WIDTH (H))	01
79 (TURBO-WIDTH (L))	00
7A (TURBO-TR (H))	01
7B (TURBO-TR (L))	00
7C (SHUT-COUNT 2)	02
7D (SHUT-COUNT 3)	02
80 (USER R-Y GAIN)	10
81 (USER B-Y GAIN)	0D
82 (USER B-Y HUE)	0D
83 (USER R-Y HUE)	0C
84 (USER SHP LEVEL)	0A
85 (USER Y LEVEL)	0C
96 (SHUTTER IN)	B1
97 (SHUTTER OUT)	8B
AC (BTM SLP R)	48
AD (BTM SLP B)	70
AE (MDL SLP R)	30
AF (MDL SLP B)	40

Adjustment Address	Adjustment Data Initial Value
B1 (TOP SLP B)	10
B2 (KEIKO R)	60
B3 (KEIKO B)	20
B4 (BTM UP)	A3
B5 (BTM DWN)	74
B6 (MDL UP)	A5
B7 (MDL DWN)	84
BA (KEIKO)	92
BB (KEIKO DWN)	82
BC (R TOP LMT)	96
C3 (B DOWN LMT)	19
C4 (LL LMT)	06
C5 (TM DIVID)	6E
C6 (BM DIVID)	41
C7 (DELAY TM)	0D
C8 (FAST TM)	30
C9 (OUT HYS OFF)	15
CA (OUT B HYS)	0D
D0 (SYSTEM)	00
E0 (DISPLAY MODE)	FF
EB (MODE)	00
EC (AWB MODE 3)	01
ED (AWB MODE 2)	00
EE (AWB MODE 1)	00

Table. 9-5.

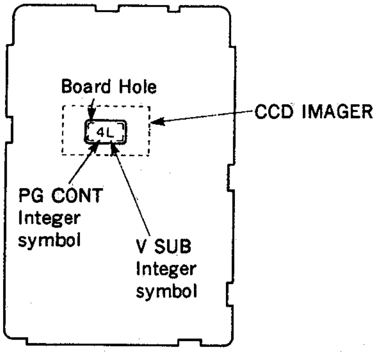
[Adjustment Method]

1) Set the adjustment page to F with the adjustment remote control.
2) Set the adjustment data for each adjustment address to the initial value with the adjustment remote control.
3) Change the adjustment address in order to memorize the last adjustment data.

9-3-5. PG CONT/V SUB Adjustment (CD-58 Board)

Note: PG CONT specified voltage and V SUB specified volatage are indicated by the two digits on CCD imager.

CD-58 BOARD (CONDUCTOR SIDE)



- PG CONT

Integer symbol	Voltage (V)
0	0.5
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

- V SUB

Integer symbol	Voltage (V)	Integer symbol	Voltage (V)	Integer symbol	Voltage (V)
A	7.0	J	11.0	S	15.0
B	7.5	K	11.5	T	15.5
C	8.0	L	12.0	U	16.0
D	8.5	M	12.5	V	16.5
E	9.0	N	13.0	W	17.0
F	9.5	P	13.5	X	17.5
G	10.0	Q	14.0	Y	18.0
H	10.5	R	14.5	Z	18.5

Example: For 「4L」 display,
•PG CONT=2.5V
•V SUB=12.0V

Fig. 9-13.

A. PG CONT Adjustment

Object	Not used
Measurement point	Checkpoint array pin (A2) (PG CONT)
Measuring instrument	Digital voltmeter
Adjustment page	F
Adjustment address	13 (PG CONT)
Specified value	(CCD imager specified voltage) $\pm 0.1V_{DC}$

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 13 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ± 0.1Vdc with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

B. V SUB Adjustment

Object	Not used
Measurement point	Checkpoint array pin (B4) (V SUB)
Measuring equipment	Digital voltmeter
Adjustment page	F
Adjustment address	12 (V SUB)
Specified value	(CCD imager specified voltage) ±3%

[Adjustment Method]

1) Set the adjustment page F and the adjustment address 12 with the adjustment remote control.
2) Change the adjustment data to be (CCD imager specified voltage) ±3% with the adjustment remote control.
3) Change the adjustment address to store the adjustment data.

9-3-6. HALL Adjustment (AF-85 Board)

Object	White pattern standard picture frame All black (Put a black cap over lens)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	1B (HALL GAIN) 1C (HALL OFFSET)
Specified value	White pattern: C0±1 All black: 03±2

[Adjustment Method]

1) Set the adjustment page to F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 05 with the adjustment remote control.
3) Change the adjustment data of address 1B and 1C, so that the data of white pattern is C0±1, all black is 03±2.
4) Change the adjustment address to store the adjustment data.

9-3-7. IRIS Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Filter	ND filter: 0.5 (0.1+0.4)
Measurement point	Checkpoint array pin (B11) (IRIS OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	19 (IRIS)
Specified value	150±10 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 19 with the adjustment remote control.
2) With no ND filter attached, change the adjustment data with the adjustment control to adjust the IRIS OUT signal level to 150±10 mV.
3) Attach the ND filter 0.5 (0.1+0.4) in front of the lens and check that the signal level changes smoothly.
4) Remove the ND filter and check that the signal level is 150±20 mV.
5) When the specified value is not met, repeat the steps 2) through 4).
6) Change the adjustment address in order to store the adjustment data.

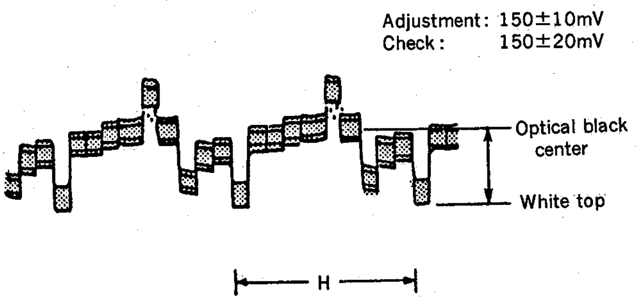


Fig. 9-14.

9-3-8. Shutter IN/OUT Adjustment (AF-85 Board)

Object	White pattern standard picture frame
Filter	ND filter: 0.5 (0.1+0.4)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	97 (SHUTTER OUT) 96 (SHUTTER IN)

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 11 with the adjustment remote control.
3) Change the adjustment address in order to store the adjustment data.
4) Set the 1/2000 mode with the shutter speed button.
5) Set the 👥 mode with the program AE button.
6) Attach the ND filter 0.5 (0.1+0.4) to the front of the lens, and confirm that the data of AF microcomputer data reader jig is more than 81. (This data is assumed as data S.)
7) Set the adjustment address 97 with adjustment remote control and enter to the adjustment data S.
8) Set the adjustment address 96 with adjustment remote control and enter to the adjustment data (S+0A).
9) Change the adjustment address in order to store the adjustment data.
10) Attach the black cap to the front of the ND filter 0.5 and confirm that the data of AF microcomputer data reader jig is FF.
11) After adjustment, set the adjustment address EB and the adjustment data 00. Change the adjustment address in order to store the adjustment data.

9-3-9. AGC Adjustment (VC-94 Board)

Note : When there is much noise, measure by inserting 5.6kΩ resistance.

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin Ⓑ3 (Y (LPF) OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	1A (AGC)
Specified value	180±5 mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 1A with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to set the Y (LPF) signal level to 180±5 mV.
3) Change the adjustment address in order to store the adjustment data.

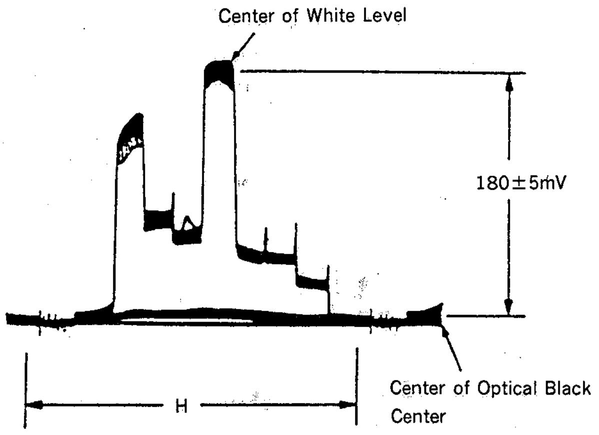


Fig. 9-15.

9-3-10. Matrix Adjustment

(1) Y1 Gain Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin Ⓐ5 (VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	07 (Y_1 Gain)
Specified value	$Y_0 - Y_1 = 0 \pm 5$mV

[Preparation]

1) Short the checkpoint array pin Ⓑ8 (Y_2 Gain) and pin Ⓑ5 (VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 07 by the adjustment remote control.
4) Change the adjustment data and set the $Y_0 - Y_1$ waveform to be a straight line. (There should not be difference.)
5) Change the adjustment address in order to store the adjustment data.
6) Open the checkpoint array pin Ⓑ8 and pin Ⓑ5

Note : After the adjustment, be sure to adjust the matrix (2) Y_2 Gain Adjustment.

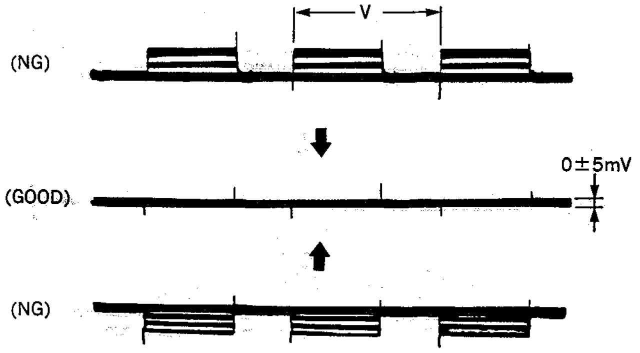


Fig. 9-16.

(2) Y_2 Gain Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin(A5)(VAP OUT)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	06 (Y_2 GAIN)
Specified value	0±5mV

[Preparation]

1) Short the chickpoint array pin(B5)(VAP SLICE) with GND.

[Adjustment Method]

1) Select the adjustment page F by the adjustment remote control.
2) Select the adjustment address 0F by the adjustment remote control and preset the adjustment data to be 00. (VAP GAIN : MAX)
3) Select the adjustment address 06 by the adjustment remote control.
4) Change the adjustment data and set the $(Y_1-\frac{Y_0+Y_2}{2})$ waveform to be a straight line. (There should not be difference.)
5) Select the adjustment address 0F by the adjustment remote control and set the adjustment data to be 7A.
6) Change the adjustment address in order to store the adjustment data.
7) Open the checkpoint array pin(B5) .

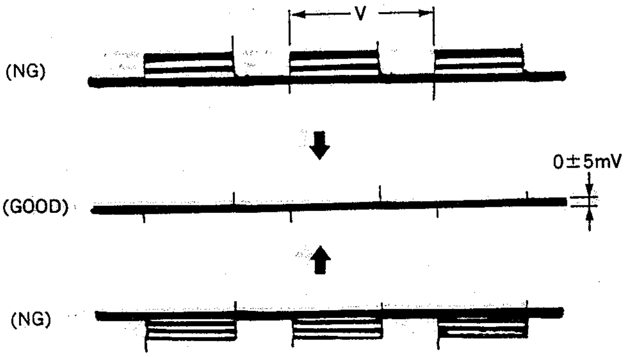


Fig. 9-17.

(3) C_1 Gain Adjustment

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	03 (C_1 GAIN)
Specified value	Minimize the divided bright point. (Cyan, green ···Within 2.0 mm Magenta ······ Within 1.0 mm Others ········· Within 0.5 mm)

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 03 by the adjustment remote control.
2) Change the adjustment data to coincide each color bright point.
3) Change the adjustment address in order to store the adjustment data.

Specified Values When Vectorscope is used.

(Specified value :Cyan, Green. . . . Within 2.0mm
Magenta . . . . . . Within 1.0mm
Others . . . . Within 0.5mm)

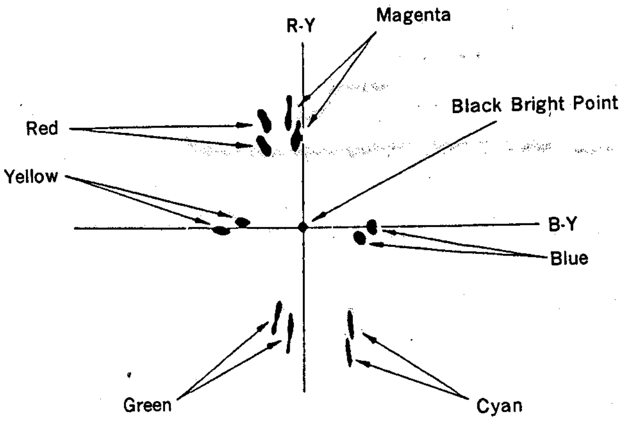


Fig. 9-18.

9-3-11. Y_H Level Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin (A6) (TP)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	08 (Y_H GAIN)
Specified value	0±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 08 by the adjustment remote control.
2) Change the adjustment data by the adjustment remote control in order that the output is a straght line. (There should not be difference : 0+5mV)
3) Change the adjustment address in order to store the adjustment data.

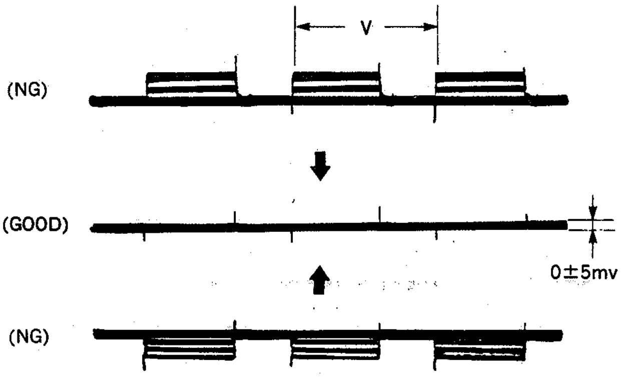


Fig. 9-19.

9-3-12. Chroma Level Adjustment (VC-94 Borad)

Object	Color bar chart standard picture frame
Measurement point	Checkpoint array pin (A7) (WB-G)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	11 (C LEVEL)
Specified value	320±20mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 11 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the White level to 320±20 mV.
3) Change the adjustment address in order to store the adjustment data.

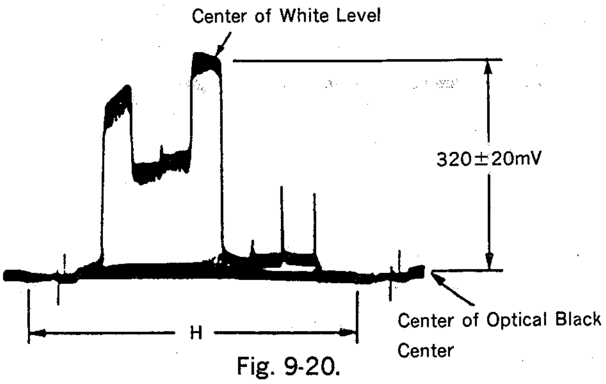


Fig. 9-20.

9-3-13. Sync. Level Adjustment (VC-94 Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	16 (SYNC LEVEL)
Specified value	145±5mV

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 16 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the sync. level to 145±5mV.
3) Change the adjustment address in order to store the adjustment data.

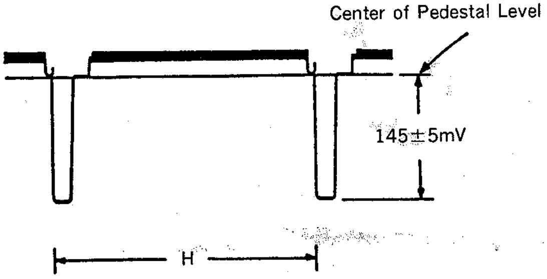


Fig. 9-21.

9-3-14. Setup Adjustment (VC-94 Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	10 (SET UP) 18 (MAX GAIN)
Specified value	15±5mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 18 with the adjustment remote control, make note of the adjustment data of this address (data F), and then, set the adjustment data to 00.
3) Select the adjustment address 10 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the setup level to 15±5mV.
5) Select the adjustment address 18 and enter to the adjustment data F.
6) Change the adjustment address in order to store the adjustment data.

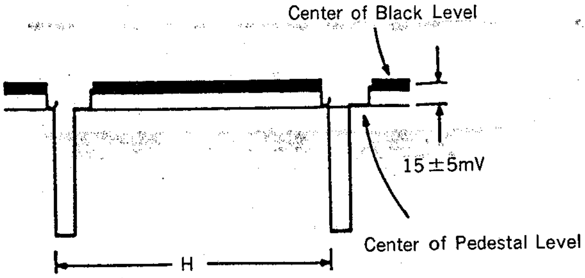


Fig. 9-22.

9-3-15. White Clip Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	15 (WC) 0E (Y LEVEL)
Specified value	420±10mV

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address 0E with the adjustment remote control, make note of the adjustment data of this address (data G), and then, set the adjustment data to FF.
3) Set the adjustment address to 15 with the adjustment remote control.
4) Change the adjustment data with the adjustment remote control to adjust the white clip level to 420±10mV.
5) Select the adjustment address 0E and enter to adjustment data G.
6) Change the adjustment address in order to store the adjustment data.
7) Make Y level adjustment as described in 9-3-15.

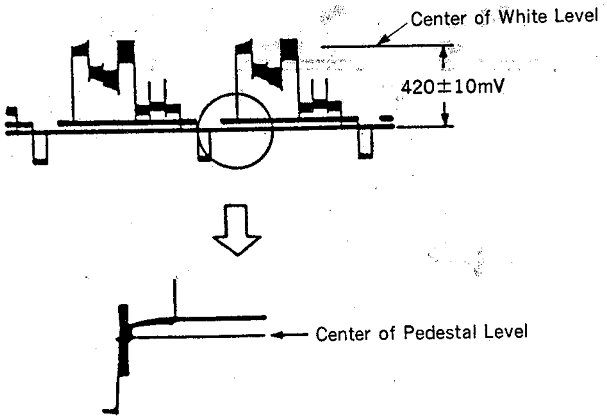


Fig. 9-23.

9-3-16. Y Level Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0E (Y LEVEL)
Specified value	330±5mV

[Adjustment Method]

1) Check that the specified value in "9-3-15 White Clip Adjustment" is met.
2) Select the adjustment page F and the adjustment address 0E with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control and adjust the Y signal level to 330±5mV.
4) Change the adjustment address in order to store the adjusment data.

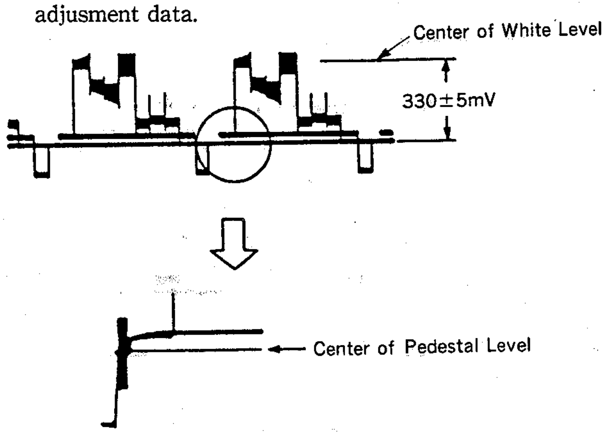


Fig. 9-24.

9-3-17. H Aperture Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	0D (SHP LEVEL)
Specified value	40±5mV

[Adjustment Method]

1) Turn the focusing ring to maximize the aperture level (waveform peak).
2) Select the adjustment page F and the adjustment address 0D with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to set the aperture level (lower peak between "green" and "white") to a point 40±5mV above the pedestal level.
4) Change the adjustment address in order to store the adjustment data.

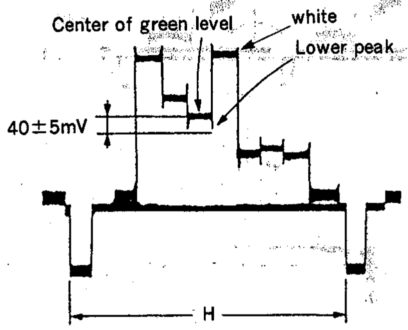


Fig. 9-25.

9-3-18. Max. Gain Adjustment (VC-94 Board)

Object	Color bar chart standard picture frame
Filter	ND filter: 2.6 (0.3+0.4+0.9+1.0)
Measurement point	CN307 pin ① (Y OUT) or checkpoint array pin (A8) (CAM Y)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	18 (MAX GAIN)
Specified value	170±5mV

[Adjustment Method]

1) Cover the lens with the ND filter 2.6 (0.3+0.4+0.9+1.0).
2) Select the adjustment page F and the adjustment address 18 with the adjustment remote control.
3) Change the adjustment address with the adjustment remote control to adjust the Y signal level to 170±5mV.
4) Change the adjustment address in order to store the adjustment data.

Note : Although the ND filter is combined by using 4 pcs, if your ND filter is combined by using 3 pcs or less, resulting in 2.6, this combination should be available.

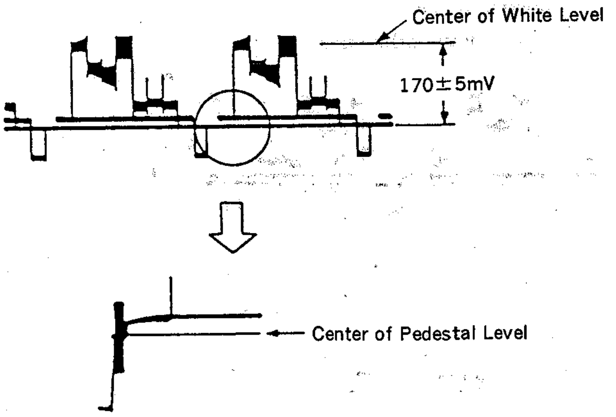


Fig. 9-26.

9-3-19. Burst Level Adjustment (VC-94 Board)

Object	All black (Cover the lens with a black cap.)
Measurement point	CN307 pin ③ (C OUT) or checkpoint array pin (A10) (CAM C)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	17 (BURST LEVEL)
Specified value	140±5mVp-p

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 17 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to adjust the burst level to 140±5mVp-p.
3) Change the adjustment address in order to store the adjustment data.

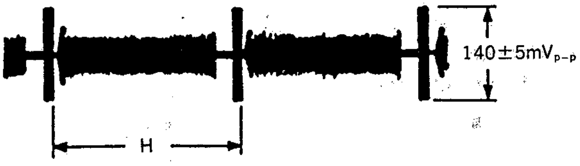


Fig. 9-27.

9-3-20. Standard AE Level Adjustment (AF-85 Board)

Object	Color bar chart standard picture frame, All black (Cover with a black cap)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	60 (IRIS REF-NOR) 8C 61 (IRIS REF-PO) 62 (IRIS REF-SP)
Specified value	$(D_{60}-D_{8C}) > 24$

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Set the adjustment address EB and the adjustment data 13 with the adjustment remote control.
3) Change the adjustment address 60.
4) Input the value of the AF microcomputer data reader jig to the adjustment address 60. (This adjustment data of the adjustment address is set to D_{60}).
5) Make all black. (Cover with a black cap)
6) Input the value of the AF microcomputer data reader jig to the adjustment address 8C. (This adjustment data of the adjustment address 8C is set to D_{8C})
7) Check that it is $(D_{60}-D_{8C}) > 24$. When the value of $(D_{60}-D_{8C})$ is between 21 and 24, set the adjustment address each 76 and 71 and the adjustment data 05 from 06.
8) Input the value of $(D_{60}-08)$ to the adjustment address 61 and 62.

Example)

The adjustment data D_{60} of the adjustment address 60		The input value of the adjustment address 61 and 62
5A	⟶	52
5B	⟶	53
5C	⟶	54

9) Set the adjustment address EB and the adjustment data 00 with the adjustment remote control.
10) Change the adjustment address in order to store the adjustment data.

9-3-21 (A). Pre-white Balance Adjustment (With Vectorscope)

Object	All white pattern
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	05 (R GAIN) 04 (B GAIN)
Specified value	The center of a white bright point must be within a circle of ϕ 1 mm centering around the origin

[Adjustment Method]

1) Maximize the gain of vectorscope.
2) Select the adjustment page F and the adjustment address 05 with the adjustment remote control.
3) Change the adjustment data with the adjustment remote control to coincide the white bright point with the origin.
4) Select the adjustment address 04.
5) Change the adjustment data to coincide the white bright point with the origin.
6) Repeat the steps 2) through 5).
7) Return the gain of vectorscope to CAL, and make sure that center of the bright point is located inside a circle of 1 mm diameter apart from the origin.
8) Change the adjustment address in order to store the adjustment data.

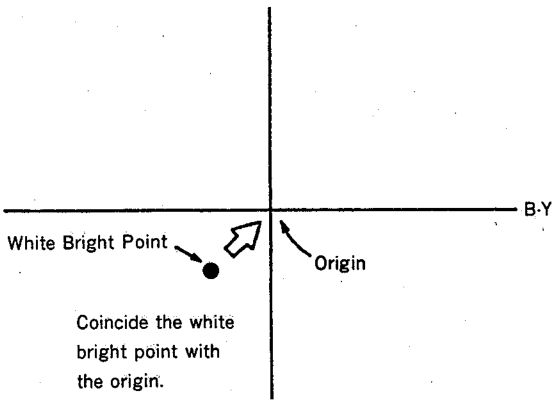


Fig. 9-28.

9-3-21 (B). Pre-white Balance Adjustment (With Oscilloscope) (VC-94 Board)

Object	All white pattern
Measurement point	CN307 pin ③ (C OUT) or checkpoint array pin (A10) (CAM C)
Measuring instrument	Oscilloscope
Adjustment page	F
Adjustment address	05 (R GAIN) 04 (B GAIN)
Specified value	Chroma signal amplitude minimum

[Adjustment Method]

1) Select the adjustment page F and the adjustment address 05 with the adjustment remote control.
2) Change the adjustment data with the adjustment remote control to minimize a chroma signal amplitude.
3) Select the adjustment address 04.
4) Change the adjustment data to minimize the chroma signal amplitude.
5) Repeat the steps 1) through 4).
6) Change the adjustment address in order to store the adjustment data.

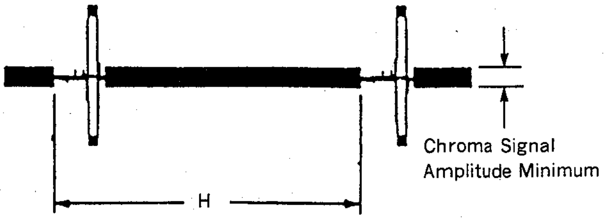


Fig. 9-29.

9-3-22. Color Reproducibility Adjustment (With Vectorscope)

Object	Color bar chart standard picture frame
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Adjustment page	F
Adjustment address	09 (R-Y GAIN) 0A (B-Y GAIN) 0B (R-Y HUE) 0C (B-Y HUE)
Specified value	All color bright points must be within a color reproduction frame.

Note : Burst level adjustment and pre-white balance adjustment must have been completed.

[Adjustment Method]

1) Set the adjustment page F with the adjustment remote control.
2) Change the adjustment data of each adjustment address with the adjustment remote control to collect all the color bright points within the color reproduction frame.
3) Change the adjustment address in order to store the adjustment data.

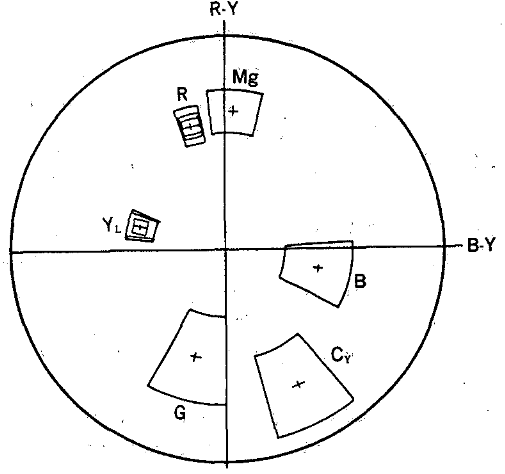


Fig. 9-30.

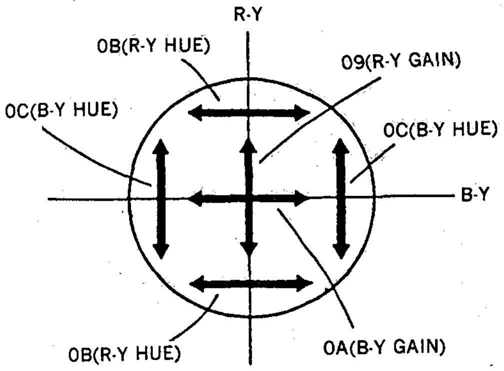


Fig. 9-31. Adjustment Addresses and Bright Point Moving Directions

9-3-23. Auto White Balance Adjustment

Note 1 : Be sure to make "preset adjustment" and "auto white balance adjustment" in that order.

(1) Preset Adjustment

Object	White pattern standard picture frame
Adjustment page	F
Adjustment address	EE (AWB MODE 1)

Note 1 : Make preset adjustment 30 seconds or more after turning on the power.

Note 2 : When redoing preset adjustment, turn off the power once, and then, turn it on again.

[Adjustment Method]

1) Turn off/on the power.
2) Obtain a picture of white pattern for over five seconds. (AF switch is turned off.)
3) Select the adjustment page F with the adjustment remote control.
4) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 01.
5) Change the adjustment address in order to store the adjustment data. (3200K data fetch 1)
6) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 23.
7) Change the adjustment address in order to store the adjustment data. (3200K data fetch 2)
8) Check that the LANC data is changed and the adjustment address 95 is selected.
9) Select the adjustment address EE by the adjustment remote control and set the adjustment data to be 00.
10) Change the adjustment address in order to store the adjustment data.
11) Make auto white balance adjustment.

(2) Auto White Balance Adjustment

Note 1 : Be sure to make this adjustment after preset adjustment.

Object	White pattern standard picture frame
Filter	Color temperature compensation filter C14 (C12+C2)
Measuring instrument	Vectorscope
Measurement point	VIDEO OUT terminal
Adjustment page	F
Adjustment address	01 (R CONT) 02 (B CONT) 98 (START R) 99 (START B) 9A (R OUT DOOR) 9B (B OUT DOOR) A0 (Ra) A1 (Rb) A2 (Rc) A3 (Ba) A4 (Bb) A5 (Bc) A6 (R/B TOP) A7 (R/B MDL) A8 (R/B BTM) A9 (B/R TOP) AA (B/R MDL) AB (B/R BTM) B0 (TOP SLP R) B8 (TOP UP) B9 (TOP DWN) BD (R DWN LMT) BE (B DWN LMT) BF (B IN TOP) C0 (B IN MAX) C1 (B OUT MIN) C2 (B OUT DWN)
Specified value	The white and black bright points must coincide.

[Adjustment Method]

1) Select the adjustment page F with the adjustment remote control.
2) Select the adjustment address EE (AWB MODE1) with the adjustment remote control and enter the adjustment data 10. (Set of WB DIRECT)
3) Cover the lens with the C14 filter.
4) Change the adjustment data of the adjustment addresses 01 and 02 with the adjustment remote control to coincide the white bright point with the origin.
At this time, assume the data of the adjustment address 01 as Rc14 and that of the adjustment address 02 as Bc14.

5) Input the value on the AWB adjustment data list (Refer to page 228) from the value of Rc14 and Bc14 to each address, and then proceed to the item 16). If the value does not come under the list, caluculate the adjustment data by the calculation from item 6).

6) Make that the adjustment address 01 data of the adjustment remote control on the item 4) is C_1 and the adjustment address 02 data is C_2.

7) Convert C_1 into a decimal number to assume it as C_1', and C_2 as well as C_2'. (Refer to Table 9-4 "Hexadecimal-Decimal Conversion Table")

8) Obtain D_{9A}' anb D_{9B}' by the following formula.

$$D_{9A}'=C_1'+2 \qquad D_{9B}'=C_2'+6$$

9) Convert D_{9A}' and D_{9B}' into a hexadecimal number and assume its value as D_{9A} and D_{9B}. (Round fractions below a decimal number to the nearest whole number)

10) Select the adjustment address 9A and enter the adjustment data D_{9A}.

11) Select the adjustment address 9B and enter the adjustment data D_{9B}.

12) Obtain A and B in the hexadecimal numbers by the following formula, and convert them into the decimal numbers. The values are A′ and B′.

$A=5A-D_{9A}$

$B=D_{9B}-50$

13) Obtain the adjustment data of each adjustment address in the decimal numbers by the following formula.

$D_{A0}'=90-A'\times 1.12$

$D_{A1}'=D_{9A}'$

$D_{A2}'=90-A'\times 0.593$

$D_{98}'=D_{A2}'$

$D_{BE}'=B'\times 2+80$

$D_{BF}'=D_{9B}'$

$D_{C0}'=B'\times 0.84+80$

$D_{C1}'=D_{C0}'$

$D_{C2}'=B'\times 0.3+80$

$D_{A3}'=B'\times 1.34+80$

$D_{99}'=D_{A5}'$

$D_{A4}'=D_{9B}'$

$D_{A5}'=B\times 0.467+80$

$D_{BD}=90-A'\times 1.7$

14) The above items, calculate by decimal and input by hexadecimal.

15) The below items, calculate by hexadecimal and input the adjustment data to each adjustment address.

$$D_{A6}=\frac{(D_{A1}-D_{A0})\times 40}{(D_{A3}-D_{A4})}$$

$$D_{A7}=\frac{(D_{A2}-D_{A1})\times 40}{(D_{A4}-D_{A5})}$$

$$D_{A8}=\frac{(5A-D_{A2})\times 40}{(D_{A5}-50)}$$

$$D_{A9}=\frac{(D_{A3}-D_{A4})\times 10}{(D_{A1}-D_{A0})}$$

$$D_{AA}=\frac{(D_{A4}-D_{A5})\times 10}{(D_{A2}-D_{A1})}$$

$$D_{AB}=\frac{(D_{A5}-50)\times 10}{(5A-D_{A2})}$$

$$D_{B0}=D_{A9}$$

$$D_{B8}=\frac{(D_{A1}+0A)\times D_{B0}+D_{A4}\times 10}{40}$$

$$D_{B9}=\frac{(D_{A1}-11)\times D_{B0}+D_{A4}\times 10}{40}$$

16) Select the adjustment address EE and enter the adjustment data 00.

17) Change the adjustment address in order to store the adjustment data.

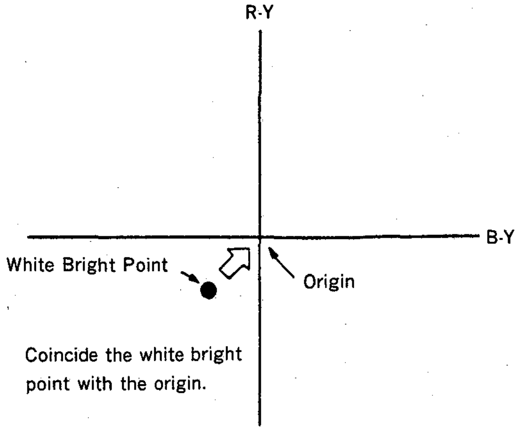


Fig. 9-32.

•AWB Adjustment Data Table

Rc14;Bc14	adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	9	BD	BE	BF	C0	C1	C2
3D 78	4A	65	3F	7E	3C	3F	4A	8E	7E	65	C	1C	31	55	24	15	55	81	5D	2C	AC	7E	77	77	5E
3D 79	4A	66	3F	7F	3C	3F	4A	8F	7F	66	C	1C	2F	55	24	16	55	81	5D	2C	AE	7F	77	77	5E
3D 7A	4A	66	3F	80	3C	3F	4A	90	80	66	C	1B	2F	55	26	16	55	81	5D	2C	B0	80	78	78	5E
3D 7B	4A	67	3F	81	3C	3F	4A	92	81	67	B	1B	2D	5B	26	17	5B	88	61	2C	B2	81	79	79	5F
3D 7C	4A	67	3F	82	3C	3F	4A	93	82	67	B	1A	2D	5B	27	17	5B	88	62	2C	B4	82	7A	7A	5F
3D 7D	4A	68	3F	83	3C	3F	4A	94	83	68	B	1A	2B	5B	27	18	5B	88	62	2C	B6	83	7B	7B	5F
3D 7E	4A	68	3F	84	3C	3F	4A	96	84	68	B	19	2B	60	29	18	60	8F	66	2C	B8	84	7C	7C	60
3D 7F	4A	69	3F	85	3C	3F	4A	97	85	69	B	19	29	60	29	19	60	8F	66	2C	BA	85	7D	7D	60
3D 80	4A	69	3F	86	3C	3F	4A	98	86	69	B	18	29	60	2A	19	60	8F	67	2C	BC	86	7D	7D	60
3D 81	4A	6A	3F	87	3C	3F	4A	9A	87	6A	A	18	27	65	2A	1A	65	95	6B	2C	BE	87	7E	7E	61
3D 82	4A	6A	3F	88	3C	3F	4A	9B	88	6A	A	17	27	65	2C	1A	65	96	6B	2C	C0	88	7F	7F	61
3D 83	4A	6B	3F	89	3C	3F	4A	9C	89	6B	A	17	26	65	2C	1B	65	96	6B	2C	C2	89	80	80	61
3D 84	4A	6B	3F	8A	3C	3F	4A	9E	8A	6B	A	17	26	6B	2D	1B	6B	9C	6F	2C	C4	8A	81	81	61
3D 85	4A	6C	3F	8B	3C	3F	4A	9F	8B	6C	A	17	25	6B	2D	1C	6B	9C	6F	2C	C6	8B	82	82	62
3D 86	4A	6C	3F	8C	3C	3F	4A	A0	8C	6C	A	16	25	6B	2F	1C	6B	9D	70	2C	C8	8C	82	82	62
3D 87	4A	6C	3F	8D	3C	3F	4A	A2	8D	6C	9	15	25	70	30	1C	70	A3	74	2C	CA	8D	83	83	62
3D 88	4A	6D	3F	8E	3C	3F	4A	A3	8E	6D	9	15	23	70	30	1D	70	A3	74	2C	CC	8E	84	84	63
3D 89	4A	6D	3F	8F	3C	3F	4A	A4	8F	6D	9	15	23	70	31	1D	70	A4	74	2C	CE	8F	85	85	63
3D 8A	4A	6E	3F	90	3C	3F	4A	A6	90	6E	9	15	22	75	31	1E	75	AA	78	2C	D0	90	86	86	63
3D 8B	4A	6E	3F	91	3C	3F	4A	A7	91	6E	9	14	22	75	33	1E	75	AA	79	2C	D2	91	87	87	64
3E 78	4B	65	40	7E	3D	40	4B	8E	7E	65	C	1C	2E	55	24	16	55	82	5E	2E	AC	7E	77	77	5E
3E 79	4B	66	40	7F	3D	40	4B	8F	7F	66	C	1C	2C	55	24	17	55	82	5E	2E	AE	7F	77	77	5E
3E 7A	4B	66	40	80	3D	40	4B	90	80	66	C	1B	2C	55	26	17	55	83	5F	2E	B0	80	78	78	5E
3E 7B	4B	67	40	81	3D	40	4B	92	81	67	B	1B	2A	5B	26	19	5B	89	63	2E	B2	81	79	79	5F
3E 7C	4B	67	40	82	3D	40	4B	93	82	67	B	1A	2A	5B	27	19	5B	89	63	2E	B4	82	7A	7A	5F
3E 7D	4B	68	40	83	3D	40	4B	94	83	68	B	1A	28	5B	27	1A	5B	8A	63	2E	B6	83	7B	7B	5F
3E 7E	4B	68	40	84	3D	40	4B	96	84	68	B	19	28	60	29	1A	60	90	68	2E	B8	84	7C	7C	60
3E 7F	4B	69	40	85	3D	40	4B	97	85	69	B	19	26	60	29	1B	60	90	68	2E	BA	85	7D	7D	60
3E 80	4B	69	40	86	3D	40	4B	98	86	69	B	18	26	60	2A	1B	60	91	68	2E	BC	86	7D	7D	60
3E 81	4B	6A	40	87	3D	40	4B	9A	87	6A	A	18	25	65	2A	1C	65	97	6C	2E	BE	87	7E	7E	61
3E 82	4B	6A	40	88	3D	40	4B	9B	88	6A	A	17	25	65	2C	1C	65	97	6C	2E	C0	88	7F	7F	61
3E 83	4B	6B	40	89	3D	40	4B	9C	89	6B	A	17	24	65	2C	1D	65	97	6D	2E	C2	89	80	80	61
3E 84	4B	6B	40	8A	3D	40	4B	9E	8A	6B	A	17	24	6B	2D	1D	6B	9E	71	2E	C4	8A	81	81	61
3E 85	4B	6C	40	8B	3D	40	4B	9F	8B	6C	A	17	22	6B	2D	1E	6B	9E	71	2E	C6	8B	82	82	62
3E 86	4B	6C	40	8C	3D	40	4B	A0	8C	6C	A	16	22	6B	2F	1E	6B	9E	71	2E	C8	8C	82	82	62
3E 87	4B	6C	40	8D	3D	40	4B	A2	8D	6C	9	15	22	70	30	1E	70	A5	76	2E	CA	8D	83	83	62
3E 88	4B	6D	40	8E	3D	40	4B	A3	8E	6D	9	15	21	70	30	1F	70	A5	76	2E	CC	8E	84	84	63
3E 89	4B	6D	40	8F	3D	40	4B	A4	8F	6D	9	15	21	70	31	1F	70	A5	76	2E	CE	8F	85	85	63
3E 8A	4B	6E	40	90	3D	40	4B	A6	90	6E	9	15	20	75	31	20	75	AC	7A	2E	D0	90	86	86	63
3E 8B	4B	6E	40	91	3D	40	4B	A7	91	6E	9	14	20	75	33	20	75	AC	7A	2E	D2	91	87	87	64
3F 78	4B	65	41	7E	3E	41	4B	8E	7E	65	C	1A	2E	55	28	16	55	84	60	30	AC	7E	77	77	5E
3F 79	4B	66	41	7F	3E	41	4B	8F	7F	66	C	1A	2C	55	28	17	55	84	60	30	AE	7F	77	77	5E
3F 7A	4B	66	41	80	3E	41	4B	90	80	66	C	19	2C	55	2A	17	55	84	60	30	B0	80	78	78	5E
3F 7B	4B	67	41	81	3E	41	4B	92	81	67	B	19	2A	5B	2A	19	5B	8B	64	30	B2	81	79	79	5F
3F 7C	4B	67	41	82	3E	41	4B	93	82	67	B	18	2A	5B	2B	19	5B	8B	65	30	B4	82	7A	7A	5F
3F 7D	4B	68	41	83	3E	41	4B	94	83	68	B	18	28	5B	2B	1A	5B	8B	65	30	B6	83	7B	7B	5F
3F 7E	4B	68	41	84	3E	41	4B	96	84	68	B	17	28	60	2D	1A	60	92	69	30	B8	84	7C	7C	60
3F 7F	4B	69	41	85	3E	41	4B	97	85	69	B	17	26	60	2D	1B	60	92	69	30	BA	85	7D	7D	60
3F 80	4B	69	41	86	3E	41	4B	98	86	69	B	16	26	60	2E	1B	60	92	6A	30	BC	86	7D	7D	60
3F 81	4B	6A	41	87	3E	41	4B	9A	87	6A	A	16	25	65	2E	1C	65	99	6E	30	BE	87	7E	7E	61
3F 82	4B	6A	41	88	3E	41	4B	9B	88	6A	A	15	25	65	30	1C	65	99	6E	30	C0	88	7F	7F	61
3F 83	4B	6B	41	89	3E	41	4B	9C	89	6B	A	15	24	65	30	1D	65	99	6E	30	C2	89	80	80	61
3F 84	4B	6B	41	8A	3E	41	4B	9E	8A	6B	A	15	24	6B	32	1D	6B	A0	73	30	C4	8A	81	81	61
3F 85	4B	6C	41	8B	3E	41	4B	9F	8B	6C	A	15	22	6B	32	1E	6B	A0	73	30	C6	8B	82	82	62

Rc14	Bc14	adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	L	BD	BE	BF	C0	C1	C2
3F	86	4B	6C	41	8C	3E	41	4B	A0	8C	6C	A	14	22	6B	33	1E	6B	A0	73	30	C8	8C	82	82	62
3F	87	4B	6C	41	8D	3E	41	4B	A2	8D	6C	9	13	22	70	35	1E	70	A7	77	30	CA	8D	83	83	62
3F	88	4B	6D	41	8E	3E	41	4B	A3	8E	6D	9	13	21	70	35	1F	70	A7	78	30	CC	8E	84	84	63
3F	89	4B	6D	41	8F	3E	41	4B	A4	8F	6D	9	13	21	70	36	1F	70	A7	78	30	CE	8F	85	85	63
3F	8A	4B	6E	41	90	3E	41	4B	A6	90	6E	9	13	20	75	36	20	75	AE	7C	30	D0	90	86	86	63
3F	8B	4B	6E	41	91	3E	41	4B	A7	91	6E	9	12	20	75	38	20	75	AE	7C	30	D2	91	87	87	64
40	78	4C	65	42	7E	3F	42	4C	8E	7E	65	C	1A	2B	55	28	18	55	85	61	31	AC	7E	77	77	5E
40	79	4C	66	42	7F	3F	42	4C	8F	7F	66	C	1A	29	55	28	19	55	85	61	31	AE	7F	77	77	5E
40	7A	4C	66	42	80	3F	42	4C	90	80	66	C	19	29	55	2A	19	55	85	61	31	B0	80	78	78	5E
40	7B	4C	67	42	81	3F	42	4C	92	81	67	B	19	27	5B	2A	1A	5B	8C	66	31	B2	81	79	79	5F
40	7C	4C	67	42	82	3F	42	4C	93	82	67	B	18	27	5B	2B	1A	5B	8C	66	31	B4	82	7A	7A	5F
40	7D	4C	68	42	83	3F	42	4C	94	83	68	B	18	25	5B	2B	1B	5B	8C	66	31	B6	83	7B	7B	5F
40	7E	4C	68	42	84	3F	42	4C	96	84	68	B	17	25	60	2D	1B	60	93	6B	31	B8	84	7C	7C	60
40	7F	4C	69	42	85	3F	42	4C	97	85	69	B	17	24	60	2D	1D	60	93	6B	31	BA	85	7D	7D	60
40	80	4C	69	42	86	3F	42	4C	98	86	69	B	16	24	60	2E	1D	60	94	6B	31	BC	86	7D	7D	60
40	81	4C	6A	42	87	3F	42	4C	9A	87	6A	A	16	22	65	2E	1E	65	9A	6F	31	BE	87	7E	7E	61
40	82	4C	6A	42	88	3F	42	4C	9B	88	6A	A	15	22	65	30	1E	65	9A	70	31	C0	88	7F	7F	61
40	83	4C	6B	42	89	3F	42	4C	9C	89	6B	A	15	21	65	30	1F	65	9B	70	31	C2	89	80	80	61
40	84	4C	6B	42	8A	3F	42	4C	9E	8A	6B	A	15	21	6B	32	1F	6B	A1	74	31	C4	8A	81	81	61
40	85	4C	6C	42	8B	3F	42	4C	9F	8B	6C	A	15	20	6B	32	20	6B	A1	74	31	C6	8B	82	82	62
40	86	4C	6C	42	8C	3F	42	4C	A0	8C	6C	A	14	20	6B	33	20	6B	A2	75	31	C8	8C	82	82	62
40	87	4C	6C	42	8D	3F	42	4C	A2	8D	6C	9	13	20	70	35	20	70	A8	79	31	CA	8D	83	83	62
40	88	4C	6D	42	8E	3F	42	4C	A3	8E	6D	9	13	1F	70	35	21	70	A9	79	31	CC	8E	84	84	63
40	89	4C	6D	42	8F	3F	42	4C	A4	8F	6D	9	13	1F	70	36	21	70	A9	7A	31	CE	8F	85	85	63
40	8A	4C	6E	42	90	3F	42	4C	A6	90	6E	9	13	1E	75	36	22	75	AF	7E	31	D0	90	86	86	63
40	8B	4C	6E	42	91	3F	42	4C	A7	91	6E	9	12	1E	75	38	22	75	B0	7E	31	D2	91	87	87	64
41	78	4C	65	43	7E	40	43	4C	8E	7E	65	C	17	2B	55	2C	18	55	86	62	33	AC	7E	77	77	5E
41	79	4C	66	43	7F	40	43	4C	8F	7F	66	C	17	29	55	2C	19	55	86	62	33	AE	7F	77	77	5E
41	7A	4C	66	43	80	40	43	4C	90	80	66	C	16	29	55	2E	19	55	87	63	33	B0	80	78	78	5E
41	7B	4C	67	43	81	40	43	4C	92	81	67	B	16	27	5B	2E	1A	5B	8D	67	33	B2	81	79	79	5F
41	7C	4C	67	43	82	40	43	4C	93	82	67	B	15	27	5B	30	1A	5B	8E	67	33	B4	82	7A	7A	5F
41	7D	4C	68	43	83	40	43	4C	94	83	68	B	15	25	5B	30	1B	5B	8E	68	33	B6	83	7B	7B	5F
41	7E	4C	68	43	84	40	43	4C	96	84	68	B	15	25	60	32	1B	60	95	6C	33	B8	84	7C	7C	60
41	7F	4C	69	43	85	40	43	4C	97	85	69	B	15	24	60	32	1D	60	95	6C	33	BA	85	7D	7D	60
41	80	4C	69	43	86	40	43	4C	98	86	69	B	14	24	60	34	1D	60	95	6D	33	BC	86	7D	7D	60
41	81	4C	6A	43	87	40	43	4C	9A	87	6A	A	14	22	65	34	1E	65	9C	71	33	BE	87	7E	7E	61
41	82	4C	6A	43	88	40	43	4C	9B	88	6A	A	13	22	65	35	1E	65	9C	71	33	C0	88	7F	7F	61
41	83	4C	6B	43	89	40	43	4C	9C	89	6B	A	13	21	65	35	1F	65	9C	71	33	C2	89	80	80	61
41	84	4C	6B	43	8A	40	43	4C	9E	8A	6B	A	13	21	6B	37	1F	6B	A3	76	33	C4	8A	81	81	61
41	85	4C	6C	43	8B	40	43	4C	9F	8B	6C	A	13	20	6B	37	20	6B	A3	76	33	C6	8B	82	82	62
41	86	4C	6C	43	8C	40	43	4C	A0	8C	6C	A	12	20	6B	39	20	6B	A3	76	33	C8	8C	82	82	62
41	87	4C	6C	43	8D	40	43	4C	A2	8D	6C	9	11	20	70	3B	20	70	AA	7B	33	CA	8D	83	83	62
41	88	4C	6D	43	8E	40	43	4C	A3	8E	6D	9	11	1F	70	3B	21	70	AA	7B	33	CC	8E	84	84	63
41	89	4C	6D	43	8F	40	43	4C	A4	8F	6D	9	11	1F	70	3C	21	70	AB	7B	33	CE	8F	85	85	63
41	8A	4C	6E	43	90	40	43	4C	A6	90	6E	9	11	1E	75	3C	22	75	B1	80	33	D0	90	86	86	63
41	8B	4C	6E	43	91	40	43	4C	A7	91	6E	9	10	1E	75	3E	22	75	B1	80	33	D2	91	87	87	64
42	78	4D	65	44	7E	41	44	4D	8E	7E	65	C	17	28	55	2C	1A	55	88	64	35	AC	7E	77	77	5E
42	79	4D	66	44	7F	41	44	4D	8F	7F	66	C	17	26	55	2C	1B	55	88	64	35	AE	7F	77	77	5E
42	7A	4D	66	44	80	41	44	4D	90	80	66	C	16	26	55	2E	1B	55	88	64	35	B0	80	78	78	5E
42	7B	4D	67	44	81	41	44	4D	92	81	67	B	16	24	5B	2E	1C	5B	8F	69	35	B2	81	79	79	5F
42	7C	4D	67	44	82	41	44	4D	93	82	67	B	15	24	5B	30	1C	5B	8F	69	35	B4	82	7A	7A	5F
42	7D	4D	68	44	83	41	44	4D	94	83	68	B	15	23	5B	30	1E	5B	8F	69	35	B6	83	7B	7B	5F
42	7E	4D	68	44	84	41	44	4D	96	84	68	B	15	23	60	32	1E	60	96	6E	35	B8	84	7C	7C	60
42	7F	4D	69	44	85	41	44	4D	97	85	69	B	15	21	60	32	1F	60	96	6E	35	BA	85	7D	7D	60

Rc14;	Bc14	adr98	99	9A	9B	A0	A1	A2	A3	A4	A5	A6	A7	A8	A9	AA	AB	B0	B8	9	BD	BE	BF	C0	C1	C2
42	80	4D	69	44	86	41	44	4D	98	86	69	B	14	21	60	34	1F	60	97	6E	35	BC	86	7D	7D	60
42	81	4D	6A	44	87	41	44	4D	9A	87	6A	A	14	20	65	34	20	65	9D	73	35	BE	87	7E	7E	61
42	82	4D	6A	44	88	41	44	4D	9B	88	6A	A	13	20	65	35	20	65	9E	73	35	C0	88	7F	7F	61
42	83	4D	6B	44	89	41	44	4D	9C	89	6B	A	13	1F	65	35	21	65	9E	73	35	C2	89	80	80	61
42	84	4D	6B	44	8A	41	44	4D	9E	8A	6B	A	13	1F	6B	37	21	6B	A5	78	35	C4	8A	81	81	61
42	85	4D	6C	44	8B	41	44	4D	9F	8B	6C	A	13	1E	6B	37	22	6B	A5	78	35	C6	8B	82	82	62
42	86	4D	6C	44	8C	41	44	4D	A0	8C	6C	A	12	1E	6B	39	22	6B	A5	78	35	C8	8C	82	82	62
42	87	4D	6C	44	8D	41	44	4D	A2	8D	6C	9	11	1E	70	3B	22	70	AC	7D	35	CA	8D	83	83	62
42	88	4D	6D	44	8E	41	44	4D	A3	8E	6D	9	11	1D	70	3B	24	70	AC	7D	35	CC	8E	84	84	63
42	89	4D	6D	44	8F	41	44	4D	A4	8F	6D	9	11	1D	70	3C	24	70	AC	7D	35	CE	8F	85	85	63
42	8A	4D	6E	44	90	41	44	4D	A6	90	6E	9	11	1C	75	3C	25	75	B3	82	35	D0	90	86	86	63
42	8B	4D	6E	44	91	41	44	4D	A7	91	6E	9	10	1C	75	3E	25	75	B3	82	35	D2	91	87	87	64
43	78	4E	65	45	7E	42	45	4E	8E	7E	65	C	17	25	55	2C	1C	55	89	65	36	AC	7E	77	77	5E
43	79	4E	66	45	7F	42	45	4E	8F	7F	66	C	17	23	55	2C	1D	55	89	65	36	AE	7F	77	77	5E
43	7A	4E	66	45	80	42	45	4E	90	80	66	C	16	23	55	2E	1D	55	89	65	36	B0	80	78	78	5E
43	7B	4E	67	45	81	42	45	4E	92	81	67	B	16	21	5B	2E	1F	5B	90	6A	36	B2	81	79	79	5F
43	7C	4E	67	45	82	42	45	4E	93	82	67	B	15	21	5B	30	1F	5B	90	6A	36	B4	82	7A	7A	5F
43	7D	4E	68	45	83	42	45	4E	94	83	68	B	15	20	5B	30	20	5B	91	6A	36	B6	83	7B	7B	5F
43	7E	4E	68	45	84	42	45	4E	96	84	68	B	15	20	60	32	20	60	98	6F	36	B8	84	7C	7C	60
43	7F	4E	69	45	85	42	45	4E	97	85	69	B	15	1F	60	32	21	60	98	6F	36	BA	85	7D	7D	60
43	80	4E	69	45	86	42	45	4E	98	86	69	B	14	1F	60	34	21	60	98	70	36	BC	86	7D	7D	60
43	81	4E	6A	45	87	42	45	4E	9A	87	6A	A	14	1E	65	34	23	65	9F	74	36	BE	87	7E	7E	61
43	82	4E	6A	45	88	42	45	4E	9B	88	6A	A	13	1E	65	35	23	65	9F	74	36	C0	88	7F	7F	61
43	83	4E	6B	45	89	42	45	4E	9C	89	6B	A	13	1C	65	35	24	65	9F	75	36	C2	89	80	80	61
43	84	4E	6B	45	8A	42	45	4E	9E	8A	6B	A	13	1C	6B	37	24	6B	A6	79	36	C4	8A	81	81	61
43	85	4E	6C	45	8B	42	45	4E	9F	8B	6C	A	13	1B	6B	37	25	6B	A6	79	36	C6	8B	82	82	62
43	86	4E	6C	45	8C	42	45	4E	A0	8C	6C	A	12	1B	6B	39	25	6B	A7	7A	36	C8	8C	82	82	62
43	87	4E	6C	45	8D	42	45	4E	A2	8D	6C	9	11	1B	70	3B	25	70	AE	7E	36	CA	8D	83	83	62
43	88	4E	6D	45	8E	42	45	4E	A3	8E	6D	9	11	1A	70	3B	27	70	AE	7F	36	CC	8E	84	84	63
43	89	4E	6D	45	8F	42	45	4E	A4	8F	6D	9	11	1A	70	3C	27	70	AE	7F	36	CE	8F	85	85	63
43	8A	4E	6E	45	90	42	45	4E	A6	90	6E	9	11	1A	75	3C	28	75	B5	83	36	D0	90	86	86	63
43	8B	4E	6E	45	91	42	45	4E	A7	91	6E	9	10	1A	75	3E	28	76	B5	84	36	D2	91	87	87	64
44	78	4E	65	46	7E	44	46	4E	8E	7E	65	8	14	25	80	32	1C	80	C0	8A	38	AC	7E	77	77	5E
44	79	4E	66	46	7F	44	46	4E	8F	7F	66	8	14	23	80	32	1D	80	C0	8A	38	AE	7F	77	77	5E
44	7A	4E	66	46	80	44	46	4E	90	80	66	8	14	23	80	34	1D	80	C0	8A	38	B0	80	78	78	5E
44	7B	4E	67	46	81	44	46	4E	92	81	67	8	14	21	88	34	1F	88	CA	91	38	B2	81	79	79	5F
44	7C	4E	67	46	82	44	46	4E	93	82	67	8	13	21	88	36	1F	88	CB	91	38	B4	82	7A	7A	5F
44	7D	4E	68	46	83	44	46	4E	94	83	68	8	13	20	88	36	20	88	CB	91	38	B6	83	7B	7B	5F
44	7E	4E	68	46	84	44	46	4E	96	84	68	7	12	20	90	38	20	90	D5	98	38	B8	84	7C	7C	60
44	7F	4E	69	46	85	44	46	4E	97	85	69	7	12	1F	90	38	21	90	D5	99	38	BA	85	7D	7D	60
44	80	4E	69	46	86	44	46	4E	98	86	69	7	12	1F	90	3A	21	90	D6	99	38	BC	86	7D	7D	60
44	81	4E	6A	46	87	44	46	4E	9A	87	6A	7	12	1E	98	3A	23	98	E0	A0	38	BE	87	7E	7E	61
44	82	4E	6A	46	88	44	46	4E	9B	88	6A	7	11	1E	98	3C	23	98	E0	A0	38	C0	88	7F	7F	61
44	83	4E	6B	46	89	44	46	4E	9C	89	6B	7	11	1C	98	3C	24	98	E0	A0	38	C2	89	80	80	61
44	84	4E	6B	46	8A	44	46	4E	9E	8A	6B	6	11	1C	A0	3E	24	A0	EB	A7	38	C4	8A	81	81	61
44	85	4E	6C	46	8B	44	46	4E	9F	8B	6C	6	11	1B	A0	3E	25	A0	EB	A7	38	C6	8B	82	82	62
44	86	4E	6C	46	8C	44	46	4E	A0	8C	6C	6	10	1B	A0	40	25	A0	EB	A8	38	C8	8C	82	82	62
44	87	4E	6C	46	8D	44	46	4E	A2	8D	6C	6	10	1B	A8	42	25	A8	F5	AE	38	CA	8D	83	83	62
44	88	4E	6D	46	8E	44	46	4E	A3	8E	6D	6	10	1A	A8	42	27	A8	F6	AF	38	CC	8E	84	84	63
44	89	4E	6D	46	8F	44	46	4E	A4	8F	6D	6	F	1A	A8	44	27	A8	F6	AF	38	CE	8F	85	85	63

9-3-24. Outdoor White Balance Check

Object	White pattern standard picture frame
Filter	Color temperature compensation filter C14 (C12+C2)
Measurement point	VIDEO OUT terminal of the video block
Measuring instrument	Vectorscope
Specified value	Refer to Fig 9-33.

[Check Method]

1) Press the White Balance button to select the outdoor white balance mode. (A mark "☼" appears on the EVF screen or monitor screen (when the data screen is turned on)).
2) Check that the center of the white bright point is within the circumference shown in Fig. 9-33.

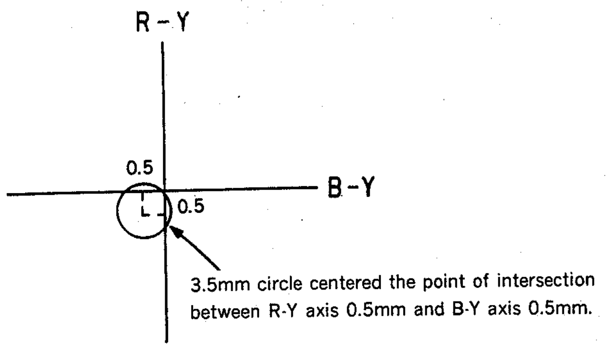

R-Y
B-Y
0.5
0.5
3.5mm circle centered the point of intersection between R-Y axis 0.5mm and B-Y axis 0.5mm.

Fig. 9-33.

9-3-25. Focus Motor Speed Adjustment (AF-85 Board)

Object	Optional
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	5D (MAN F SPEED) 4A (ADJ PWM) 2B (M SPEED-B) 2C (M SPEED-C) 2D (M SPEED-D) 2A (M SPEED-A) 2E (M SPEED-E) 5C (MAN PWM SPEED)

[Adjustment Method]

1) Set the auto mode with the FOCUS button.
2) Select the adjustment page F with the adjustment remote control.
3) Select the adjustment address EB with the adjustment remote control and set the adjustment data to F5.
4) Select the adjustment address 4A with the adjustment remote control and set the adjustment data to FF.
5) Balance the adjustment data at the adjustment address 5D so that the data indicated by the AF microcomputer data reader jig is changed from 0D to 0E after two seconds have elapsed.
6) Balance the adjustment data at the adjustment address 4A so that the data indicated by the AF microcomputer data reader jig is between 4B and 4F. (This adjustment data is assumed as LSP.)
7) Convert LSP into decimal data and assume it as LSP'.
8) Perform the following calculations in decimal form. Round down the results and convert them into hexadecimal data. Then input the data into the adjustment data at the respective adjustment addresses.

   adjustment address 2B : $\mathrm{LSP'}+\frac{255-\mathrm{LSP'}}{0.81}\times 0.05$

   adjustment address 2C : $\mathrm{LSP'}+\frac{255-\mathrm{LSP'}}{0.81}\times 0.13$

   adjustment address 2D : $\mathrm{LSP'}+\frac{255-\mathrm{LSP'}}{0.81}\times 0.31$
9) Input the adjustment data as follows:

   adjustment address 2A : LSP (the data of adjustment address 4A)
   adjustment address 2E : FF
   adjustment address 5C : the data of adjustment address 2D
10) Select the adjustment address EB with the adjustment remote control and set the adjustment data 00.
11) Change the adjustment address in order to store the adjustment data.

9-3-26. AF Adjustment

[Preparation]

1) Set the distance from the pattern box to the lens reference mark (Φ) to 1.5m. Then, place the zoom lever in the color bar chart standard picture frame position.

(1)AF Data Input (AF-85 Board)

Object	Siemens star chart standard picture frame, All black (Cover with a black cap), White pattern standard picture frame.
Filter	ND filter: 1.5 (0.1+0.4+1.0)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F
Adjustment address	27 (AGC HD) 26 (AGC MD) 30 (PA SET) 28 (LD-B) 29 (HD-B) 46 (AGC CONT W) 45 (AGC CONT B)

[Adjustment Method]

1) Place the system in the siemens star chart standard picture frame state.
2) Set the manual mode with the FOCUS button.
3) Attach the ND filter 1.5 (0.1+0.4+1.0) to the front of the lens.
4) Set the focus ring to the 1.2m and set the auto mode with the FOCUS button.
5) After 2.0 seconds, confirm that the picture of siemens star is taken clearly. Set the manual mode with the FOCUS button.
6) Detach the ND filter.
7) Select the adjustment page F with the adjustment remote control.
8) Select the adjustment address EB with the adjustment remote control and set the adjustment data to EF.
9) Change the adjustment address in order to store the adjustment data.
10) Wait until the data indicated by the AF microcomputer data reader jig data is stable (for about 1 second). Change the adjustment data at the adjustment address 27, then balance so that the data indicated by the AF microcomputer data reader jig is between B5 and BD.
11) Select the adjustment address EB with the adjustment remote control and set the adjustment data to ED.
12) Change the adjustment address in order to store the adjustment data.
13) Change the adjustment data at the adjustment address 26. Balance so that the data indicated by the AF microcomputer data reader jig is between E0 and ED.
14) Input the current readout of the AF microcomputer data reader jig into the adjustment data at the adjustment address 30.
15) Cover the lens with black cap.
16) Select the adjustment address EB with the adjustment remote control and set the adjustment data to F1.
17) Change the adjustment address in order to store the adjustment data.
18) If the readout of the AF microcomputer data reader jig is 19 or more, input it into the adjustment data at the adjustment address 28.
    If it is less than 18, input 19.
19) Select the adjustment address EB with the adjustment remote control and set the adjustment data to EF.
20) Change the adjustment address in order to store the adjustment data.
21) If the readout of the AF microcomputer data reader jig is 08 or more, input it into the adjustment data at the adjustment address 28.
    If it is 07 or less, input 08.
22) Select the adjustment address EB with adjustment remote control and set the adjustment data to 0B.
23) Change the adjustment address in order to store the adjustment data.
24) Input the current readout of the AF microcomputer data reader jig into the adjustment data at the adjustment address 46.
25) Detach the black cap and set the white pattern standard picture frame.
26) Input the current readout of the AF microcomputer data reader jig into the adjustment data at the adjustment address 45.
27) Select the adjustment address EB with adjustment remote control and set the adjustment data to 00.
28) Change the adjustment address in order to store the adjustment data.

(2)AF Evalution Value Check (AF-85 Board)

Object	Siemens star chart standard picture frame
Filter	ND filter: 1.5 (0.1+0.4+1.0)
Measurement point	CN801
Measuring instrument	AF microcomputer data reader jig
Adjustment page	F

[Checking Method]

1) Set the manual mode with the FOCUS button.
2) Attach the ND filter 1.5 (0.1+0.4+1.0) to the front of the lens.
3) Set the focus ring to the 1.2m and set the auto mode with the FOCUS button.
4) After 2.0 seconds, confirm that the picture of siemens star is taken clearly. Set the manual mode with the FOCUS mode.
5) Select the adjustment page F with the adjustment remote control.
6) Select the adjustment address EB with the adjustment remote control and set the adjustment data to EF.
7) Change the adjustment address in order to store the adjustment data.
8) Confirm that the data of the AF microcomputer data reader jig is between A3 and BD.
9) Select the adjustment address EB with the adjustment remote control and set the adjustment data to ED.
10) Change the adjustment address in order to store the adjustment data.
11) Confirm that the data of the AF microcomputer data reader jig is between D5 and ED.
12) Select the adjustment address EB with the adjustment remote control and set the adjustment data to 00.
13) Change the adjustment address in order to store the adjustment data.

(3)AF Distance Measuring Check (AF-85 Board)

Object	Siemens star chart
Filter	ND filter: 1.5 (0.1+0.4+1.0)

[Checking Methed]

1) Attach the ND filter 1.5 (0.1+0.4+1.0) to the front of the lens.
2) Set the zoom lever to the TELE end and set the manual mode with the FOCUS button.
3) Set the focus ring to the 1.2m and set the auto mode with the FOCUS button.
4) After 2.0 seconds, confirm that the picture of siemens star is taken clear. Set the manual mode with the FOCUS button.
5) Set the focus ring to the ∞ and set the auto mode with the FOCUS button.
6) After 3.0 seconds, confirm that the picture of siemens star is taken clear. Set the manual mode with the FOCUS button.

9-4. DIGITAL TITLER SYSTEM ADJUSTMENT

9-4-1. Chroma Phase/Gain Adjustment (CT-38 Board)

Mode	CAMERA Standby
Object	All Black (Cover the lens with a black cap.)
Measurement point	VIDEO OUT terminal
Measuring instrument	Vectorscope
Adjustment element	RV702
Specified value	Adjust Cy (Cyan) to the specified range. (Check that other colors are also in the specified range.)

[Adjustment Method]

1) Press the SUPERIMPOSE TITLE button (DK-15 board S950).
2) Press the COLOR/MODE button (DK-15 board S952) and select Cy(Cyan).
3) Cover the lens with a black cap.
4) Press MEMORY button (DK-15 board S953) and display the all title.
5) At this time, the specified value should be satisfied.
6) After the adjustment, make R (red), YL (yellow), G (green), MG (magenta), B (blue), and check that the specified value is satisfied.

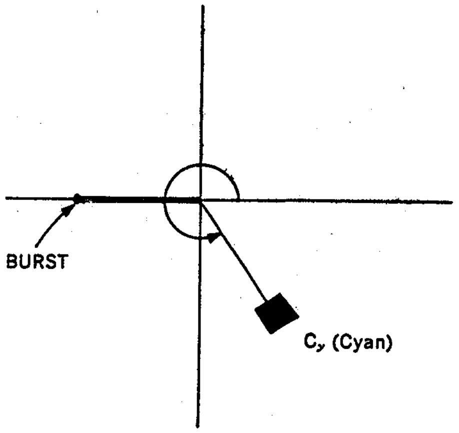


Fig. 9-34.

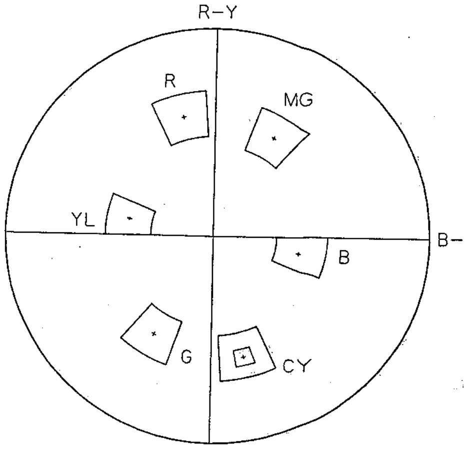


Fig. 9-35.

SECTION 10
ELECTRICAL ADJUSTMENTS (VIDEO SYSTEM)

See the adjusting part location diagram from on page 258 for the adjustment.

10-1. PREPARATION FOR ADJUSTMENT

10-1-1. Equipment Required

The following measuring instruments are needed in adjusting the VTR section.

1) Monitor TV
2) Oscilloscope Dual-trace, Bandwidth more than 10MHz with delay mode (Use a probe of 10 : 1, unless otherwise specified.)
3) Frequency counter
4) Pattern generator (with video output terminal)
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Stabilized power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)*¹
      Part number : 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)*²
      Part number : 8-967-995-12
    For operation check (WR5-4NL)*³
      Part number : 8-967-995-51
    For operation check (WR5-5NSP)*⁴
      Part number : 8-967-995-42

Note : ＊ 1 : WR5-1N(8-967-995-01)
＊ 2 : WR5-2N (8-967-995-11)
＊ 3 : WR5-3NL (8-967-995-31)
＊ 4 : WR5-3NSP(8-967-995-22)
WR5-4NSP (8-967-995-41)
} You can use these tape.

12) Adjustment remote control (RM-95 Partially remodeled product) (J-6082-053-B)
13) Extension cable (20P) J-6082-063-B (Between VA-67 board CN703 and CT-38 board CN705.)

10-1-2. Precaution for Adjustment

The video section can be also adjusted without the camera section. Remove the camera section by disconnecting the following 5 connectors.

1. VC-94 board CN305
2. DC-DC converter 2P connecter (connect the FU-100 board W991)
3. VC-94 board CN307
4. VC-94 board CN306
5. SS-136 board CN503

Remove the EVF section by disconnecting the following connector.

1. SW-183 board CN931

MIC board (MC-76 board) is not necessary for video section adjustment. Remove the MIC board by disconnecting the following connector.

1. VA-67 board CN401

Setting the switch

1. VA-67 board S201……OUT side

10-1-3. Equipment Connection

Unless otherwise specified, adjustment is made in the VTR mode by connecting the measuring instruments as shown in the figure below.

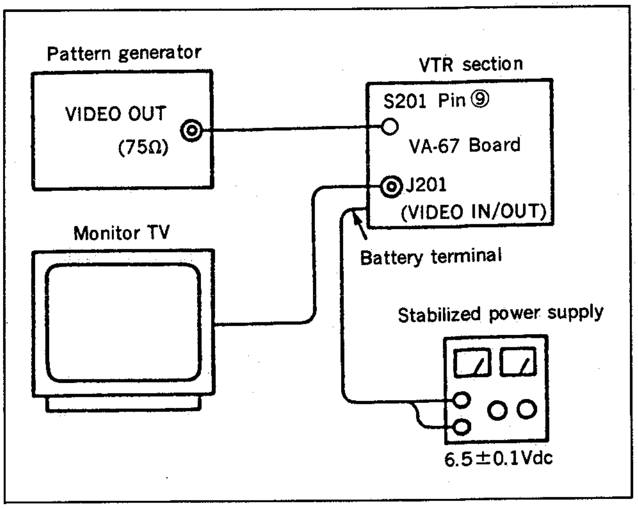


Fig. 10-1.

10-1-4. Setting up for Adjustment

Video signals output from a pattern generator are used as adjustment signals when adjusting the video section, and these video output signals should be within the required standard. Connect an oscilloscope to J201 (VIDEO IN/OUT) on theVA-67 board. Confirm that the amplitudes of video signal SYNC signals, of picture portions, and of burst signals are flat at approximately 0.3, 0.7, and 0.3V respectively, and that the level ratio of the burst signals and "red" signals are 0.30 : 0.66. Fig. 10-2 shows video signals (color burst) used in the video section adjustments.

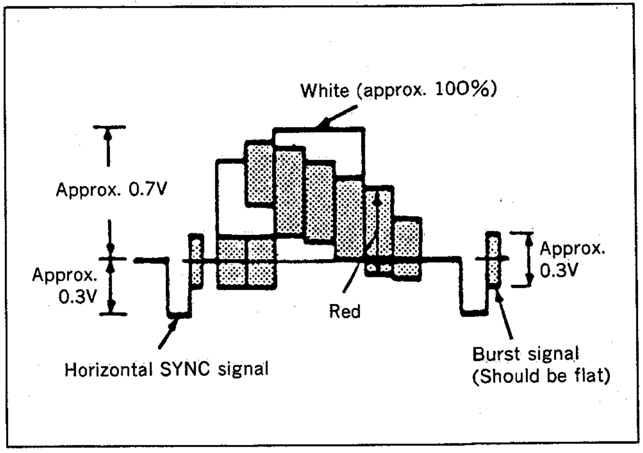
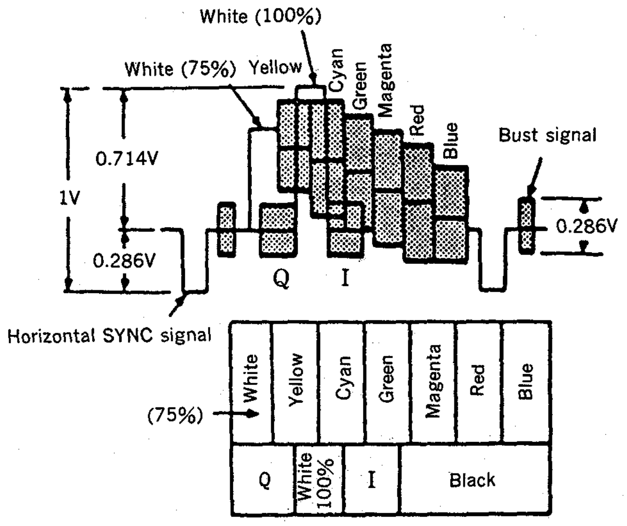


Fig. 10-2.

10-1-5. Alignment tape

<table>
<tr><th>Tape</th><th>Description</th><th>Use for</th></tr>
<tr><td>Tracking
(WR5-1NP)</td><td>1. Recording area PCM to Video
2. Recording content: CH2: 1MHz linearity adjustment signal
Switching position Adjustment marker (CH1: 9MHz)</td><td>Drum linearity adjustment</td></tr>
<tr><td>Video frequency response
(WR5-6N)</td><td>1. Recording area Video
2. Recording content RF sweep 0 to 10MHz
3. Marker 1, 3.58, 5.5 and 7MHz</td><td>Frequency response adjustment</td></tr>
<tr><td>Operation cheking
SP mode
(WR5-5NSP)
LP mode
(WR5-4NL)

Note:
PCM area is not included in WR5-4NL</td><td>1. Recording area Video
2. Recording content
■ Video area
● Video signals Color bar: 4min.
Monoscope: 4min.
〔Color bars〕


White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Bust signal
0.714V
1V
0.286V
0.286V
Q
I
Horizontal SYNC signal
(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Q
White 100%
I
Black

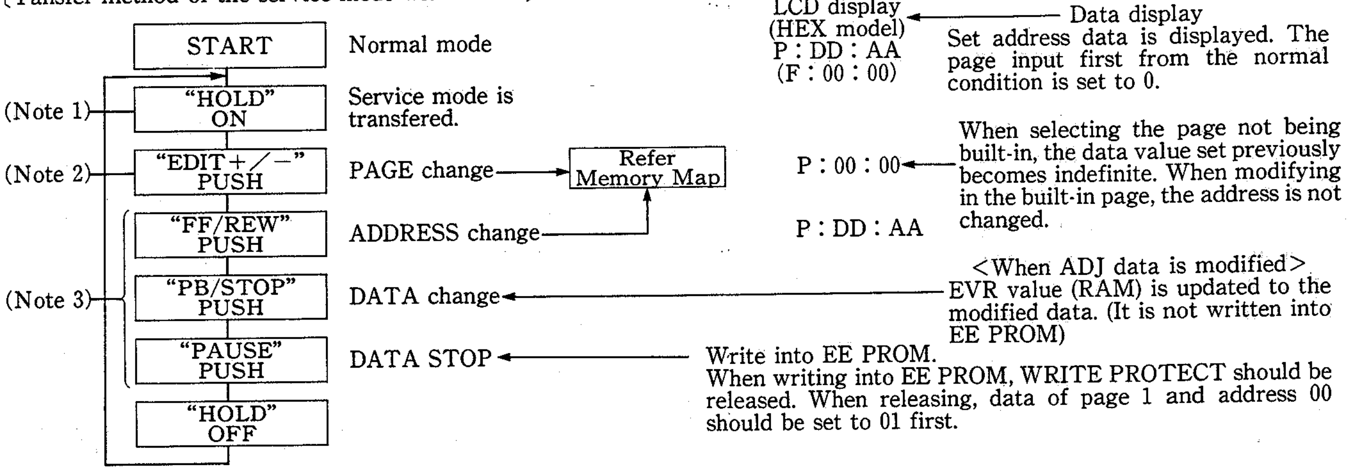
● Audio signal (AFM) 400Hz, 60% modulation
■ PCM area
● Audio signal (PCM)
1kHz, 4 min. Color bar
20Hz, 20 sec.
400Hz, 20 sec. } Monoscope
14kHz. 20 sec.</td><td>Operation checking</td></tr>
</table>

10-1-6. Input/Output Level and impedance

Video input/output	Phono jack 1Vp-p, 75Ω unbalance, sync negative
Audio input/output	Phono jack Input : −7.5dBs, input impedance more tham 47kilohms Output : −7.5dBs, at output impedance less than 1kilohms

10-1-7. Service Mode

〔Tansfer method of the service mode with RM-95〕


START
Normal mode
(Note 1)
"HOLD" ON
Service mode is transfered.
(Note 2)
"EDIT+/−" PUSH
PAGE change
Refer Memory Map
"FF/REW" PUSH
ADDRESS change
(Note 3)
"PB/STOP" PUSH
DATA change
"PAUSE" PUSH
DATA STOP
"HOLD" OFF
LCD display (HEX model)
P : DD : AA
(F : 00 : 00)
Data display
P : 00 : 00
P : DD : AA

Set address data is displayed. The page input first from the normal condition is set to 0.

When selecting the page not being built-in, the data value set previously becomes indefinite. When modifying in the built-in page, the address is not changed.

<When ADJ data is modified>
EVR value (RAM) is updated to the modified data. (It is not written into EE PROM)

Write into EE PROM.
When writing into EE PROM, WRITE PROTECT should be released. When releasing, data of page 1 and address 00 should be set to 01 first.

Command name	Command function	Function Button with RM-95
Page Up	Page+ 1	Edit Search+
Page Down	Page− 1	Edit Search−
Direct Page Set	Set to direct page	Event Clear
Address Up	Address+1	Fast Forward
Address Down	Address−1	Rewind
Data Up	Data+ 1	Play Back
Data Down	Data−1	Stop
Store	Write data into EEPROM. RAM	Pause

[ADJUST, TEST MODE description]

MODE		PAGE/DATA/ADDRESS	Contents
ADJUST	Switching Position Adjustment	D : -- : 04 (high) D : -- : 05 (low)	Switching position adjustment See to page 242 for details
	Battery Down Adjustment	D : -- : 06 (Sensor value) D : -- : 07 (Set value)	Use for battery down adjustment See to page 241 for details
TEST MODE	Pass Adjustment Truck Shift	1 : 30 : 4D	Truck shift for pass adjustment Set to the data described left and set the playback mode.
	Emergency Inhibit	1 : 10 : 4D	Detection of emergency is inhibited. Even if battery is ended, power is not turned off. SP/LP is not automatically distinguished. Emergency detection except for TAPE/TOP•END is inhibited.
	Emergency Code	D : -- : 20~22 D : -- : 24~26	First emergency is displayed. Last emergency is displayed. (See to ＊ 1)
	RECOG SW Check	1 : -- : 3D 1 : -- : 3E	Mode switch position is displayed. RECOG SW ON OFF is displayed. (See to ＊ 2)
	Function SW Check	1 : -- : E8~ED	Pressing KEY is checked. (See to ＊ 3)
	Motor single check	3 : 10 : DD (Loading Ⓜ) 3 : 11 : DD (Drum Ⓜ) 3 : 12 : DD (Capstan Ⓜ)	Rotating in right direction, inverting, stopping of each motor can be separately controlled. • Loading Motor • Drum Motor (See to ＊ 4) • Capstan Motor

MODE		PAGE/DATA/ADDRESS	Contents
TEST MODE	Sensor check	3 : 21 : DD	The following sensor is input by performing A/D selecting, and the A/D selecting value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction DEW sensor. (See to ＊5)
	Reception contents check of wireless remote control	1 : -- : 1E and 1D	The received code contents of the remote control code can be confirmed. (See to ＊6)

＊1 **Emergency Code Check**
With the SENSER LANC

(The emergency code has the first emergency and last emergency. The last emergency side is changed when emergency is generated; the first emergency side records the only code generated first.)

			First	Last	
PAGE	D	ADDRESS	20, 21	24, 25	← Emergency code
PAGE	D	ADDRESS	22	26	← Mode when emergency is generated

Displayed → Be sure to rewrite the address from 20 to 26 to data 00 after the operation.

(1) Emergency code list

Code		Emergency contents
20H, 24H	21H, 25H	
00	00	Normal mode
01	00	Loading Motor emergency.
02	00	Unloading, Reel emergency.
04	00	Steady, Reel emergency.
08	00	Capstan emergency.
00	01	Drum steady, FG emergency.
00	02	Drum steady, PG emergency.
00	21	Drum steady, FG emergency.
00	22	Drum steady, PG emergency.
00	41	Loading, Drum FG emergency.
00	42	Loading, Drum PG emergency.
00	81	Unloading, Drum FG emergency.
00	82	Unloading, Drum PG emergency.
——	——	Dram steady Phase emergency.

- In order to delete the contents of [the first and the last emergency], write with SENSER LANC as follows.

Page 1	Address 00	Data 01

After that, write data 00 into each address. After writing, return to

Page 1	Address 00	Data 00

(2) Mode code

Mode	Code	Mode	Code
STOP	20	EDIT S CUE	5A
FF	30	EDIT S REV	5B
REW	38	EDIT S STIL	5F
PB	60	+×1	62
CUE	64	−×1	63
REV	65	−STILL	79
STILL	70	+FRAME	76
REC	40	−FRAME	77
REC. P	41	+×2	66
SHUTTLE EDIT (+)	5A	−×2	62
SHUTTLE EDIT (−)	5B	LOADING	21
CAM STBY	41	UNLOADING	13
CAM REC	40	EJECTED	10
REC REV+	58	+SLOW	72
REC REV−	59	−SLOW	73

* 2 RECOG SW Check

With the SENSER LANC

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3D	MP-HG		ME/MP	REC PROOF	V MUTE	A MUTE	JOG	VA PB MODE

"1"=REC inhibit

"1"=ME/ 0 : MP

"1"=MPHG/ 0 : Normal

Page	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	3E	DEW			RP PB MODE	CASSETTE COMPARTMENT LOCK	MODE SW2	MODE SW1	MODE SW0

See to the following list

When locking the Cassette Compartment, "1"

- MODE SW CODE LIST

	Address 3E contents			Real port condition			Remark
Position	M SW2	M SW1	M SW0	M SW2	M SW1	M SW0	
EJECT	0	0	0	L	H	H	Cassette Compartment eject position
IA	0	0	1	H	H	H	Interval A
UNLOAD	0	1	0	L	L	H	Normal EJECT unloaded
IB	0	1	1	H	L	H	Interval B
STOP	1	0	0	H	L	L	STOP mode position
IC	1	0	1	H	H	L	Interval C
FWD	1	1	0	L	H	L	Pinch pressure welded
ID	1	1	1	L	L	L	Interval D
SHAKING HEAD POSITION	0	0	0	L	H	L	Shaking head ptsition

☆ This mode releasing is turn off the SENSER LANC.

*** 3 Switch check** (See to the previous page for reading code.)

With the SENSER LANC:

Page 1	Address E8 to ED	Data Refer to table

Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	K IN 7	K IN 6	K IN 5	K IN 4	K IN 3	K IN 2	K IN 1	K IN 0
E 8	——	REMOTE ON/OFF	AUTO SUPER IMPOSE	TITLE	——	MACRO AF	SHUTTER	AUTO LOCK
K OUT 0								
E 9	——	STEREO	MEMORY	COLOR	DATA SCREEN	ONE PUSH AF	AF ON/OFF	PROGRAM AE
K OUT 1								
EA	——	SUB	EDIT (+)	EDIT (−)	FRAME	AWB	BACK LIGHT	——
K OUT 2								
EB	——	STANDBY	PAUSE	RESET	REC	FADER	——	BEEP
K OUT 3								
EC	——	START/ STOP	PB	ZERO MEMORY	TIME	DATE	AGE	VTR
K OUT 4								
ED	——	Edit/ OFF	REW	STOP	EJECT	FF	SLOW	CAM
K OUT 5								

☆ This mode releasing is turn off the SENSER LANC.

- Check the initial set value in shipping after the service, because EE PROM is monuted to VTR in this unit.

D Page Initial set value in shipping (for this unit)

Address	Contents					Set value
0 0	Aging mode					00
0 1	Each flag area (destination/model /HEAD width1×2MUTE)					59
0 2	VTR REC key acceptance authorization					03
0 3						--
0 4	Switching position (low)					Adjustment value
0 5	Switching position (high)					Adjustment value
0 6	Battery A/D modification value					Adjustment value
0 7	Battery end set area					Adjustment value
1 0	SR data storage area	EDIT OFF	MP	HI8	LP	--
1 1	SR data storage area	EDIT OFF	MP	HI8	SP	--
1 2	SR data storage area	EDIT OFF	MP	NOR	LP	3E
1 3	SR data storage area	EDIT OFF	MP	NOR	SP	24
1 4	SR data storage area	EDIT OFF	ME	HI8	LP	--
1 5	SR data storage area	EDIT OFF	ME	HI8	SP	--
1 6	SR data storage area	EDIT OFF	ME	NOR	LP	3E
1 7	SR data storage area	EDIT OFF	ME	NOR	SP	24
1 8	Titler vertical position adjustment area JOG mode					08
1 9	Titler vertical position adjustment area NOR mode					06
1 A	Titler horizontal position adjustment area playback mode					11
1 B	Titler horizontal position adjustment area EE mode					11
1 C	When SR data storage area EDIT is ON: Hi8 mode					--
1 D	When SR data storage area EDIT is ON: Normal mode					24
1 E						--
1 F						--
2 0	First generated emergency code (low) (First emergecy)					00
2 1	First generated emergency code (high) (First emergency)					00
2 2	Mode code when emergency is generated first					00
2 3						00
2 4	Last generated emergency code (low) (Last emergency)					00
2 5	Last generated emergency code (high) (Last emergency)					00
2 6	Mode code when emergency is generated last.					00

∗ 4 In order to operate the motor singly

〔Operation〕

Write the following number with the SENSER LANC into Page 3 Address DD.

Then the check of each motor is performed.

10H → Loading motor
11H → Drum motor
12H → Capstan motor

After the set of the above data, operation is performed by pressing the following keys. (When the operation is performed with RM-95, set the HOLD switch to left and release the SENSER LANC.)

FF key → Rotating in right direction
REW key → Inverting
STOP key → Stop

Note) In this mode, operation is only performed on the normally loaded condition.

Note) The motor rotating speed is the normal rotating number. (Drum 30Hz, Capstan SP mode speed, Loading normal speed).

In order to release this mode, turn off the SENSER LANC and turn off the power.

∗ 5 In order to read the A/D selecting value (Sensor check)

〔Operation〕

With the SENSER LANC:

Write Page 3 Address DD Data 21

The following address (PAGE 3) of the A/D selecting value of each A/D port is displayed.

Address	Selecting value Contents
65	TOP sensor (light ON)
67	TOP sensor (light OFF)
64	END sensor (light ON)
66	END sensor (light OFF)
62	S-REEL FG
63	T-REEL FG
60	Thermistor (for SWP correction)
5F	DEW sensor

The voltage of A/D selecting 1 step: 4.9÷256≒19mV

∗ 6 In order to check the reception contents of the wireless remote control

With SENSER LANC, the received remote control code is displayed to Page 1 Address 1E.

The remote control code is only displayed while the code which the LANC code is shifted to right for 1 bit is pressed, and FF is displayed when the code is released.

The received category code of the remote control is displayed to the upper 4 bit of Page 1 Address 1D.

(The description of the remote control code is omitted in this chart.)

10-2. POWER VOLTAGE CHECK (SS-136 BOARD)

Measuring instrument	Digital voltmeter
SS 4.9V check	
Measurement point	CN506 pin ①
Specified value	4.90±0.15V$_{DC}$
AUDIO 4.9V check	
Measurement point	CN506 pin ⑦
Specified value	4.90±0.15V$_{DC}$
EVF 4.9V check	
Measurement point	CN503 pin ①
Specified value	4.90±0.15V$_{DC}$
LM 5V check	
Measurement point	CN502 pin ⑮
Specified value	4.85±0.15V$_{DC}$

[Check Method]

1) Each power voltage should satisfy the specified values at normal temperature and humidity.

10-3. SYSTEM CONTROL SYSTEM ADJUSTMENT

10-3-1. Battery Down Adjustment

Mode	CAMERA REC
Signal	Unnecessary
Measurement point	Display on the adjustment remote control
Measuring instrument	Adjustment remote control
Adjustment page	D
Adjustment address	06
Specified value	(reference value) Note : Actually, exact data of 5.5V$_{DC}$ of page D address 06 is written.

[Connection]

1) Make the set MIC board, EVF board, and CAMERA section connected.
2) Connect the adjustment remote control to the REMOTE terminal.
3) Connect the digital voltmeter so to measure the voltage of the stabilized power supply unit connected to the battery terminal.

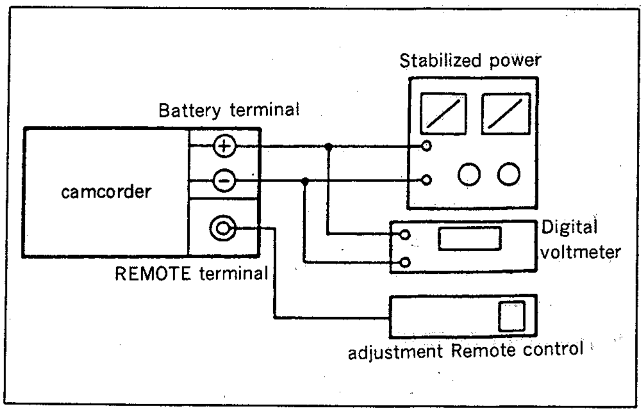
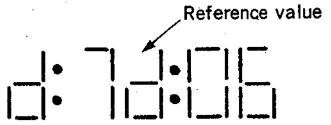


Fig. 10-3.

[Adjustment Method]

1) Turn on the POWER switch. (CAMERA mode)
2) Adjust the output of the stabilized power supply unit to be 6.3 V$_{DC}$ (battery terminal voltage).
3) Turn on the CAMERA REC mode.
4) Set the HOLD switch of the remote control for adjustment to the HOLD side.
5) Adjust the output of the stabilized power supply unit to be 5.58±0.01 V$_{DC}$. (Battery terminal voltage)
6) Press once the EDIT SEARCH (+) button of the adjustment commander select page 1, select data 01 of address 00, and release the protector.
7) Press four times the EDIT SEARCH (−)button of the remote control for adjusment. (Set the adjustment page to D.)
8) Be sure to set the adjustment address 06 with FF or REW button of the remote control for adjustment, and press the PAUSE button.



9) Turn off the POWER switch.

[Checking Method]

1) Turn on the power.
2) Adjust the output of the stabilized power supply to be 5.66±0.01V$_{DC}$.
3) Set the camera REC mode.
4) After five seconds,TALLY should flash at 0.8Hz. (Battery Pre End)
5) Adjust the output of the stabilized power supply to be 5.50±0.01V$_{DC}$.
6) Set the camera REC mode.
7) After five seconds, STOP mode should be set and TALLY should flash a 3.2Hz. (Battery END)

10-3-2. Clock Accuracy Adjustment (FU-100 Board)

Mode	E-E
Signal	Unnecessary
Measurement point	IC501 pin ㊾
Measuring instrument	Ocsilloscope Frequency counter
Adjustment element	CT501
Specified value	512.000±0.001Hz

[Adjustment Method]

1) Adjust to 512.000±0.001Hz with CT501.

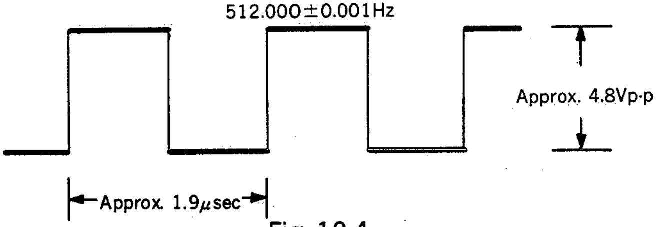


Fig. 10-4.

10-4. SERVO SYSTEM ADJUSTMENT

10-4-1. Switching Position Adjustment (SS-136 Board)

Mode	Playback
Signal	Alignment tape: Operation check (WR5-1NP)
Measurement point	CH1: CN508 pin ④ (SWP) CH2: CN508 pin ③ (PB RF)
Measuring instrument	Oscilloscope
Adjustment page	D
Adjustment address	05 04
Specified value	$t_1=0\pm5\mu$sec $t_2=0\pm5\mu$sec

[Connection]

1) Make the set CAMERA section connected.
2) Connect the adjustment remote control to the REMOTE terminal.

[Adjustment Method]

1) Set the HOLD switch of the adjustment remote control to the HOLD side. (ADJUST MODE is set.)
2) Select page 1 with the remote control for adjustment and select adjustment data 01 of adjustment address 00. (Protector is released.)

3) Press four times the EDIT SEARCH (—) button of the remote control for adjustment. (Adjustment page D is set.)
4) Select the adjustment address to 05 in order to change the adjustment data, and adjust to $t_1=0\pm5\mu$sec.

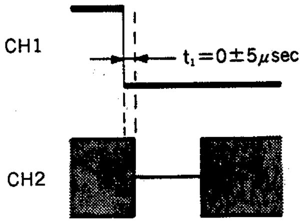


Fig. 10-5.

5) Press the PAUSE button in order to store the adjustment data.
6) Select the adjustment address 04 in order to change the adjustment data and adjust to $t_2=0\pm5\mu$sec.

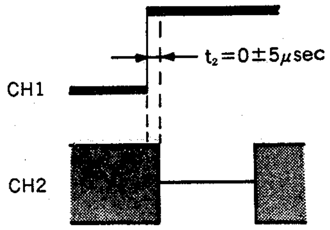


Fig. 10-6.

7) Press the PAUSE button in order to store the adjustment data.

10-4-2. Oscillation Frequency Adjustment (SS-136 Board)

Mode	Record
Signal	Unnecessary
Measurement point	Q903 collector
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	RV901
Specified value	475±5kHz

[Adjustment Method]

1) Adjust to 475±5kHz with RV901.

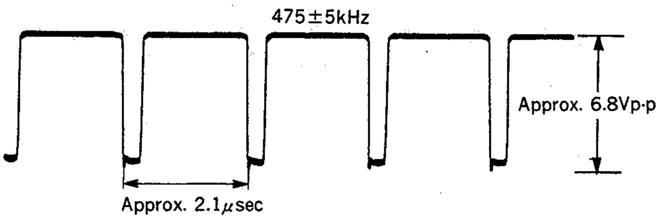


Fig. 10-7.

10-4-3. Output Voltage Adjustment (SS-136 Board)

Mode	Record
Signal	Unnecessary
Measurement point	CN507 pin ⑲
Measuring instrument	Digital voltmeter
Adjustment element	RV902
Specified value	4.90±0.05V_{DC}

[Adjustment Method]

1) Adjust to 4.90±0.05V_{DC} with RV902.

10-5. VIDEO ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure below. The color video input signal supplied from the pattern generator is used as the video input signal for video adjustment in the REC mode. Make sure that the SYNC signal and color burst signal are matched with the standard specified for set-up as shown in the Fig. 10-2 during adjustment.

[Adjustment Sequence]

1) Playback Frequency Characteristic Adjustment
2) X'tal Oscillator fo Check
3) REC E-E Level Adjustment
4) IR Adjustment
5) Chroma Comb Filter Adjustment
6) Emphasis Y Level Adjustment
7) Y FM Carrier Frequency Adjustment
8) Y FM Deviation Adjustment
9) REC Y FM Level Adjustment
10) Chroma Emphasis Adjustment
11) REC Chroma Level Adjustment
12) PB CCD Level Adjustment
13) PB Level Adjustment
14) 4FSC Frequency Adjustment
15) Controller Frequency Adjustment
16) Tracking TH Adjustment
17) Character Generator SG Frequency Adjustment
18) DDS Character Position Adjustment

10-5-1. Playback Frequency Characteristic Adjustment (SS-136 Board)

(1)

Mode	Playback
Signal	Alignment tape : Frequency characteristic adjustment (WR5-6N)
Measurement point	CH1 : CN508 pin ④ (D SWP) CH2 : CN508 pin ③ (PB RF)
Measuring instrument	Oscilloscope
Adjustment element	PB 1-CH : RP-77 board RV102 PB 2-CH : RP-77 board RV101
Specified value	3.58MHz level : 5.5MHz level = 4 : 3±0.3

[Adjustment Method]

1) Adjust PB RF OUT of PB 1-CH and PB 2-CH with respective RV so as to get the specified value.

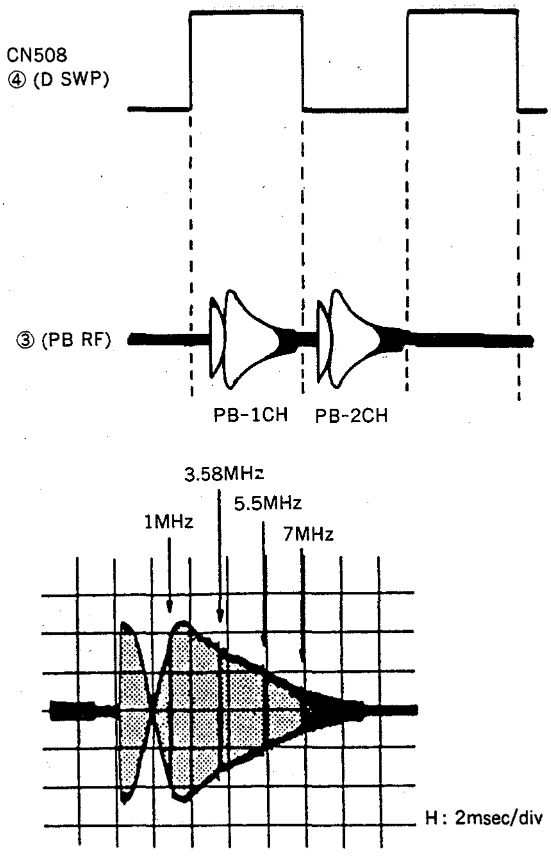

CN508
④ (D SWP)
③ (PB RF)
PB-1CH
PB-2CH
3.58MHz
5.5MHz
1MHz
7MHz
H : 2msec/div

Fig. 10-8.

10-5-2. X'tal Oscillator fo Check (VA-67 Board)

Made	E-E
Signal	Color bar
Measurement point	IC203 pin ⑫
Measuring instrument	Oscilloscope Frequency counter
Specified value	3579545±70Hz

[Check Method]

1) Make sure that the oscillation frequency of IC203 pin ⑫ is 3579545±70Hz.

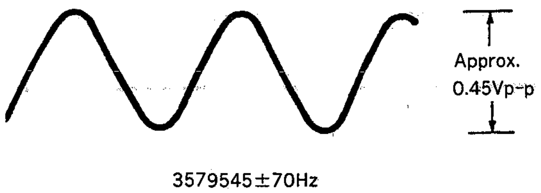

Approx.
0.45Vp-p
3579545±70Hz

Fig. 10-9.

10-5-3. REC E-E Level Adjustment (VA-67 Board)

Mode	Record or E-E
Signal	Color bar
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV205
Specified value	1.000±0.025Vp-p

[Adjustment Method]

1) Adjust to 1.000±0.025Vp-p with RV205.

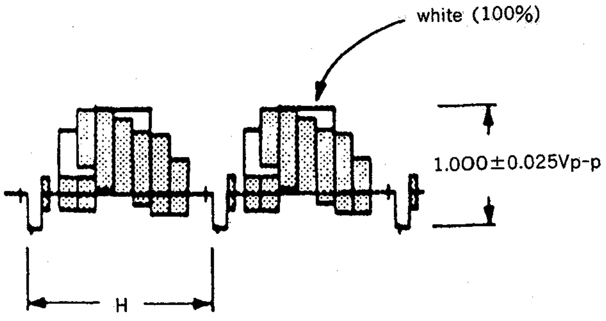

white (100%)
1.000±0.025Vp-p
H

Fig. 10-10.

10-5-4. IR Adjustment (VA-67 Board)

Mode	Record
Signal	Color bar
Measurement point	IC201 pin ⑦
Measuring instrument	Oscilloscope
Adjustment element	RV201
Specified value	Minimum red residual chroma component (80mVp-p or less)

[Connection]

1) Short TP003 and TP007.

[Adjustment Method]

1) Minimize the red residual chroma component with RV201.(80mVp-p or less)
2) After the adjustment, open TP003 and TP007.

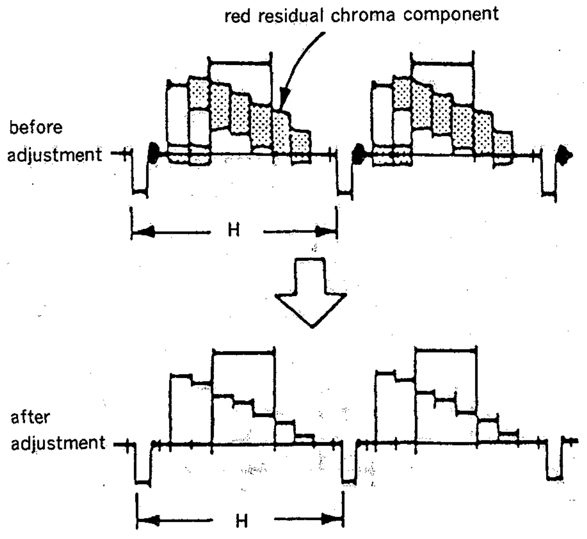

red residual chroma component
before adjustment
H
after adjustment
H

Fig. 10-11.

10-5-5. Chroma Comb Filter Adjustment (VA-67 Board)

Mode	Record
Signal	Color bar
Measurement point	IC201 pin ⑪
Measuring instrument	Oscilloscope
Adjustment element	RV204 RV211
Specified value	Minimum red residual chroma component (20mVp-p or less)

[Adjustment Method]

1) Adjust RV204 and RV211 alternately and minimize the red residual chroma component. (20mVp-p or less)

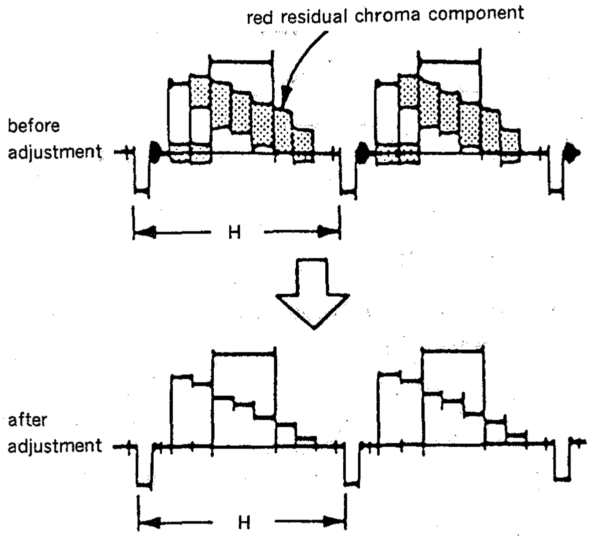

red residual chroma component
before adjustment
H
after adjustment
H

Fig. 10-12.

10-5-6. Emphasis Y Level Adjustment (VA-67 Board)

Mode	Record
Signal	Color bar
Measurement point	IC201 pin ③
Measuring instrument	Oscilloscope
Adjustment element	RV202
Specified value	500±25mVp-p

[Adjustment Method]

1) Adjust to 500±25mVp-p with RV202.

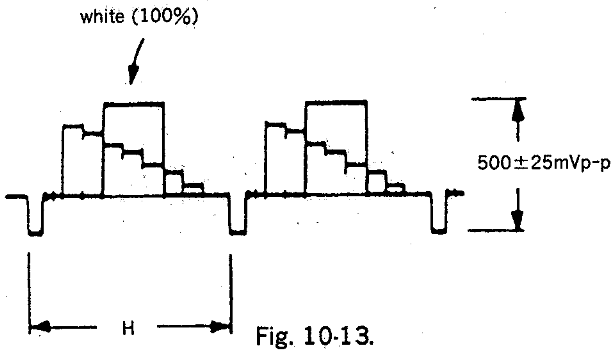


Fig. 10-13.

10-5-7. Y FM Carrier Frequency Adjustment (VA-67 Board)

Mode	Record
Signal	Non-signal
Measurement point	R158 side terminal of RV101 (REC Y)
Measuring instrument	Frequency counter
Adjustment element	RV207
Specified value	4.38±0.04MHz

[Adjustment Method]

1) Adjust to 4.38±0.04MHz with RV207.
2) Make this adjustment after completing 10-5-8. Y FM Deviation Adjustment.

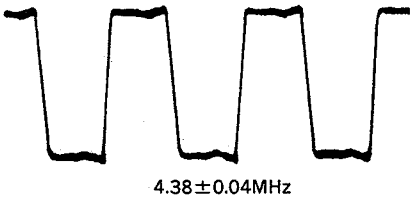


Fig. 10-14.

10-5-8. Y FM Deviation Adjustment (VA-67 Board)

Mode	Record and Playback
Signal	Color bar
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV206
Specified value	Playback level of 1.00±0.05Vp-p

Note 1: 10-5-7. Y FM Carrier Frequerncy adjustment must been completed.

Note 2: VIDEO OUT terminal (J201) must be terminated at 75Ω.

[Adjustment Method]

1) Record the color bar signal.
2) Playback the recorded signal.
3) Check the playback output level.
   Specified value: 1.00±0.05Vp-p
4) When the specified value is not, turn RV206 as follows and repeat the steps 1) through 3) above.

	RV206 Rotating Direction
When larger than specified value	Clockwise direction (↻)
When smaller than specified value	Counterclockwise direction (↺)

Table. 10-1.

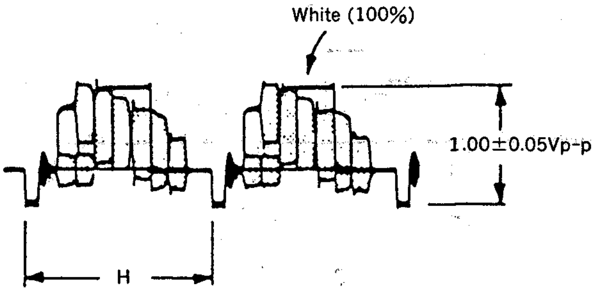


Fig. 10-15.

10-5-9. REC Y FM Level Adjustment (VA-67 Board)

Mode	Record
Signal	Non-signal
Measurement point	CN507 pin ⑤
Measuring instrument	Oscilloscope (20MHz bandwidth ON)
Adjustment element	RV101
Specified value	240±10mVp-p

[Adjustment Method]

1) Adjust to 240±10mVp-p with RV101.

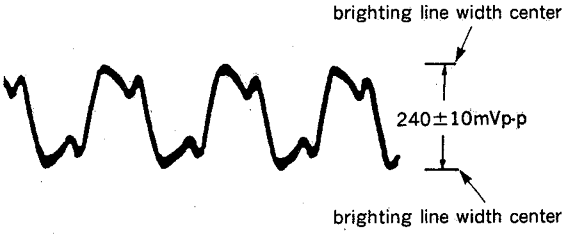

brighting line width center
240±10mVp-p
brighting line width center

Fig. 10-16.

10-5-10. Chroma Emphasis Adjustment (VA-67 Board)

Mode	Record
Signal	Color bar
Measurement point	IC203 pin ㉔
Measuring instrument	Oscilloscope
Adjustment element	FL302
Specified value	Minimum red level

[Connection]

1) Short between IC203 pin ㉔ and GND at 3.3kΩ resistance.

[Adjustment Method]

1) Minimize the red level with FL302.
2) After the Adjustment, open between IC203 pin ㉔ and GND.

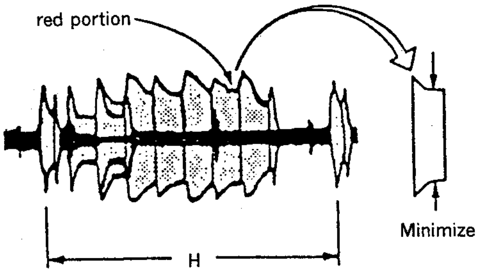

red portion
Minimize
H

Fig. 10-17.

10-5-11. REC Chroma Level Adjustment (VA-67 Board)

Mode	Record
Signal	Color bar
Measurement point	CN507 pin ①
Measuring instrument	Oscilloscope
Adjustment element	RV301
Specified value	Red portion level=125±10mVp-p

[Adjustment Method]

1) Adjust the red portion to 125±10mVp-p with RV301.

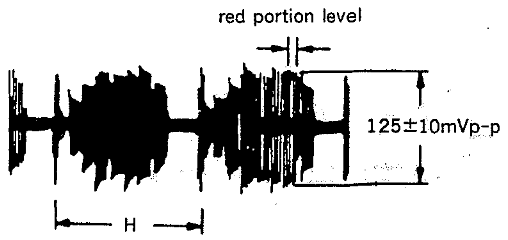

red portion level
125±10mVp-p
H

Fig. 10-18.

10-5-12. PB CCD Input Level Adjustment (VA-67 Board)

Mode	Playback
Signal	Alignment tape : Operation check (WR5-5NSP) color bar portion
Measurement point	IC201 pin ㉑
Measuring instrument	Oscilloscope
Adjustment element	RV210
Specified value	500±25mVp-p

[Adjustment Method]

1) Adjust to 500±25mVp-p with RV210.

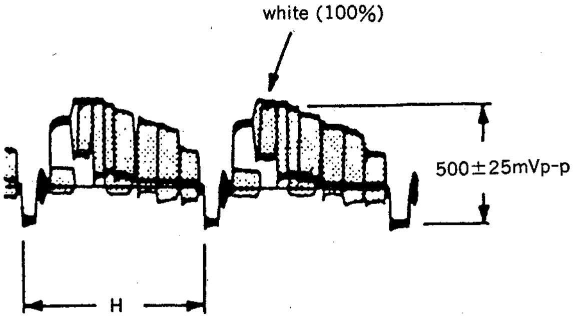

white (100%)
500±25mVp-p
H

Fig. 10-19.

10-5-13. PB Level Adjustment (VA-67 Board)

Mode	Playback
Signal	Alignment tape: Operation check (WR5-5NSP) color bar portion
Measurement point	J201 (VIDEO OUT terminal)
Measuring instrument	Oscilloscope
Adjustment element	RV203
Specified value	1.00±0.05Vp-p

[Adjustment Method]

1) Adjust to 1.00±0.05Vp-p with RV203.

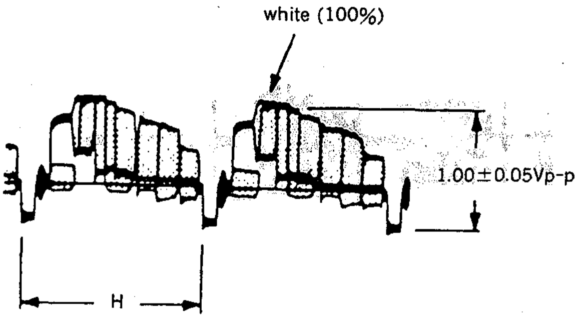


Fig. 10-20.

10-5-14. 4FSC Frequency Adjustment (CT-38 Board)

Mode	E-E
Signal	Non-signal
Measurement point	Q707 Emitter
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT702
Specified value	3579545±50Hz
Adjustment procedure	IC704 pin ⑲: $5V_{DC}$ IC704 pin ㉝: $3.5V_{DC}$

[Adjustment Method]

1) Adjust to 3579545±50Hz with CT702.

10-5-15. Controller Frequency Adjustment (CT-38 Board)

Mode	CAM E-E (All title white display)
Signal	Not required
Measurement point	VA-67 board J201 (VIDEO OUT)
Measuring instrument	Oscilloscope
Adjustment element	CT701
Specified value	1.5±0.1μ sec

Note: Perform the adjustment with the camera installed.

[Adjustment Method]

1) Display the all title (white) by fetching with the camera E-E.
2) Measure the VIDEO OUT terminal with the oscilloscope, adjust so that the width between the right end of the title and the H-SYNC is 1.5±0.1μ sec.

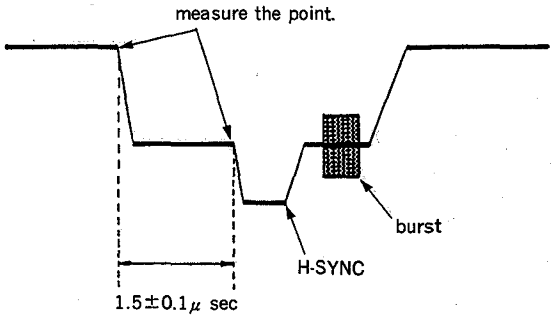


Fig. 10-21.

10-5-16. Tracking TH Adjustment (CT-38 Board)

Mode	E-E
Signal	Staircase (8 stairs)
Measurement point	CH 1 : W704 pin ⑦ (Staircase input) CH 2 : IC703 pin ① (A/D select output)
Measuring instrument	Oscilloscope
Adjustment element	RV703
Specified value	Staircases to the second stair should be fetched and the third one should not be fetched.

[Adjustment Method]

1) Adjust to satisfy the specified value with RV703. (Refer to Fig. 10-22.

Note : In the case that ten staircases are used, the third stair should be fetched and the fourth one should not be fetched.

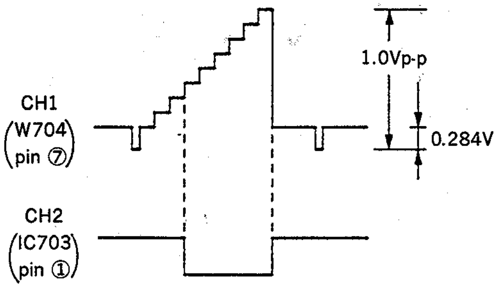


Fig. 10-22.

10-5-17. Character Generator SG Frequency Adjustment (CT-38 Board)

Mode	E-E
Signal	Non-signal
Measurement point	IC902 pin ⑲
Measuring instrument	Oscilloscope Frequency counter
Adjustment element	CT902
Specified value	15734±100Hz

[Adjustment Method]

1) Adjust to 15734±100Hz with CT902.

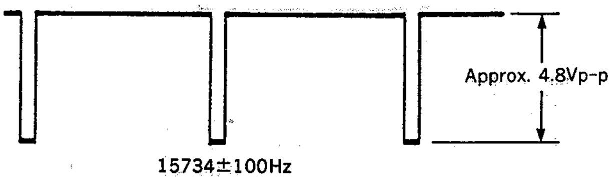


Fig. 10-23.

10-5-18. DDS Character Position Adjustment (CT-38 Board)

Mode	E-E
Signal	Color bar (used signal of TG-7)
Measurement point	EVF
Measuring instrument	EVF
Adjustmen element	CT901
Specified value	Refer to Fig. 10-24.

[Adjustment Method]

1) Turn on the DATA SCREEN switch (VK-14 board S508). (Check that it is displayed on the EVF.)
2) Adjust the last inner line to the dividing line between red and blue with CT901. (Refer to Fig. 10-24)
3) Turn off the DATA SCREEN switch (VK-14 board S508). (Check that it went out on the EVF.)

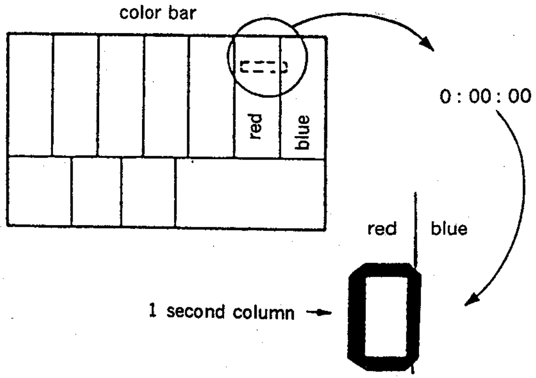


Fig. 10-24.

10-6. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instrument]

In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

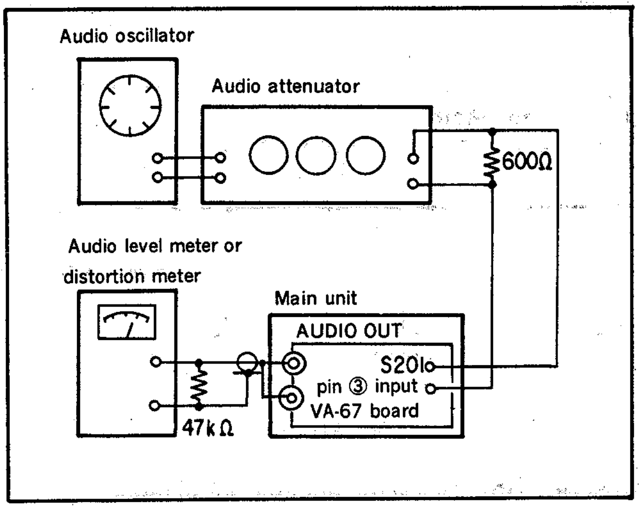

Audio oscillator
Audio attenuator
600Ω
Audio level meter or distortion meter
Main unit
AUDIO OUT
S201 pin ③ input
VA-67 board
47kΩ

Fig. 10-25.

10-6-1. AFM Carrier Frequency Check (VA-67 Board)

Mode	Recording
Signal	Non-signal
Measurement point	IC400 pin ⑧
Measuring instrument	Frequency counter
Specified value	1.500±0.002MHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

[Checking Method]

1) Turn OFF the audio oscillator output.
2) Confirm that the AFM carrier frequency is 1.500 ±0.002MHz.

10-6-2. REC AFM Carrier Level Check (VA-67 Board)

Mode	Recording
Signal	Non-signal
Measurement point	CN507 pin ②
Measuring instrument	Oscilloscope
Specified value	105±5mVp-p

[Checking Method]

1) Confirm that the level is 105±5mVp-p.

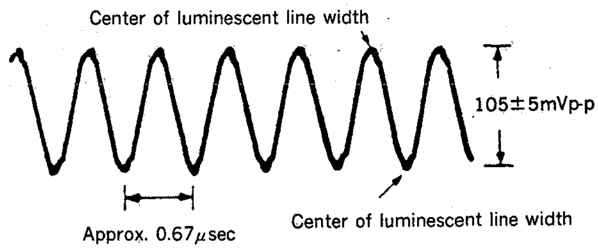

Center of luminescent line width
105±5mVp-p
Approx. 0.67μsec
Center of luminescent line width

Fig. 10-26.

10-6-3. IR Adjustment (VA-67 Board)

Mode	Playback
Signal	Alignment tape : Operation checking (WR5-5NSP)
Measurement point	IC400 pin ④
Measuring instrument	Oscilloscope
Adjustment element	RV400
Specified value	Refer to Fig. 10-27.

[Preparation]

1) Short between IC400 pin ④ and GND at 4.7kΩ resistance.

[Adjustment Method]

1) As shown in Fig. 10-27, adjust RV400.
2) After the adjustment, open between IC400 pin ④ and GND.

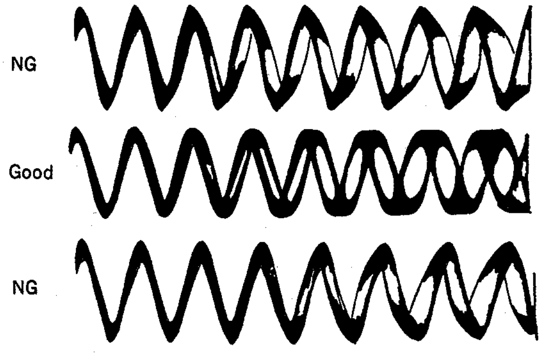


Fig. 10-27.

10-6-4. Deviation Adjustment

Mode	Playback
Signal	Alignment tape : Operation checking (WR5-5NSP)
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Adjustment element	RV401
Specified value	−7.5±1.0dBs

[Adjustment Method]

1) Adjust to −7.5±1.0dBs with RV401.

10-6-5. E-E Output Level Check

Mode	E-E
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs

[Checking Method]

1) Make sure that the audio output level is −7.5±2dBs.

10-6-6. Overall Level Check

Mode	Self-recording and playback
Signal	400Hz, −7.5dBs.
Measuremrnt point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs.

[Checking Method]

1) Record the signal.
2) Playback the recorded section
3) Make sure that the audio output level is −7.5±2dBs.

10-6-7. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400Hz, −17.5dBs Ⓑ 30Hz, −17.5dBs Ⓒ 10Hz, −17.5dBs
Measurement point	Audio output termial
Measuring instrument	Audio level meter
Specified value	With the 400Hz playback output level as 0dB, the playback output level of 30Hz and 10kHz is 0±3dB

[Checking Method]

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400Hz playback output level as 0dB, confirm that the playback output level of 30Hz and 10kHz is 0± 3dB.

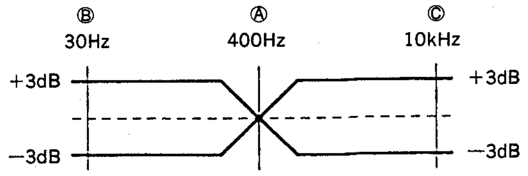


Fig. 10-28.

10-6-8. Overall Distortion Check

Mode	Self recording and playback
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Distorsion meter
Specified value	Less than 0.8%*1

[Checking Method]

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.8%.*1

* 1 Value when 200Hz to 3kHz BPF is used.

10-6-9. Overall Noise Level Check

Mode	Self-recording and playback
Signal	No signal (Shorting plug is inserted into audio input jack)
Measurement point	Audio input terminal
Measuring instrument	Audio level meter
Specified value	Less than −62.0dBs*2

[Checking Method]

1) Record the signal
2) Playback the recorded section
3) Make sure that the noise level is less than −62.0dBs.*2

∗ 2 Value when IHF-A hearing correction filter is used.

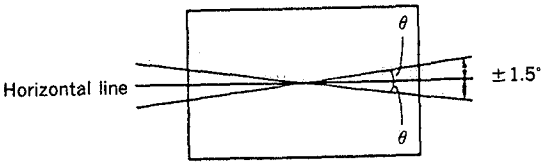
10-7. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (A TYPE) (VF-27 BOARD)

10-7-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified value	See Fig. 10-29

[Adjustment Method]

1) By turning RV904 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
2) Loosen the DY (deflection yoke) tightening nut.
3) Make the image horizontal by rotating DY.
4) Retighten the DY tightening nut. (Do not tighten excessively.)


θ
Horizontal line
±1.5°
θ

Specified value : Image orientation within ± 1.5° of horizontal line.

Fig. 10-29.

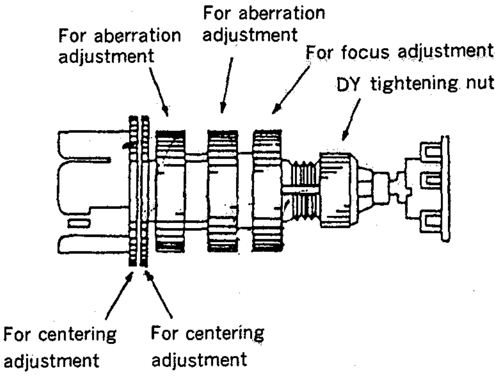

For aberration adjustment
For aberration adjustment
For focus adjustment
DY tightening nut
For centering adjustment
For centering adjustment

Fig. 10-30.

10-7-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified value	See Fig. 10-31.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even night, left, upper and lower margins. (See Fig. 10-30.)

Note : Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

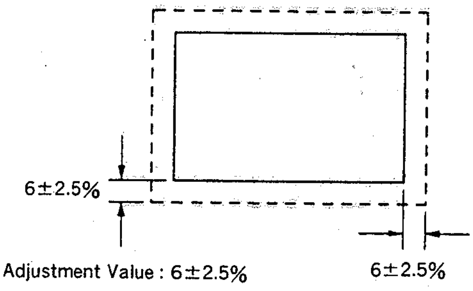


Fig. 10-31.

10-7-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion

[Adjustment Method]

1) Adjust for optimum focus using the focus ring. (See Fig. 10-30.)

10-7-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified value	See Fig. 10-32.

[Adjustment Method]

1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
2) If off center, repeat the Centering Adjustment.

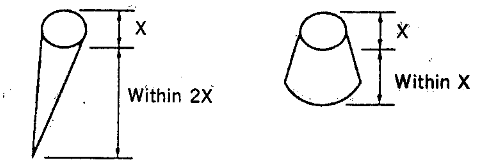


Fig. 10-32.

10-7-5. Horizontal Oscillation Frequency Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP)
Measurement point	CN904 pin ⑤
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	RV901
Specified value	2.60±0.05V_{DC}

[Adjustment Method]

1) Adjust to 2.60±0.05V_{DC} using RV901.

10-7-6. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for cheking operation (WR5-5NSP) Monoscope portion
Adjustment element	C911
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV902.
2) Rotate RV904 to set the brightness to the normal level.
3) Short or open the pattern (A) of the H size adjustment capacitor (C911) to provide horizontal overscans of 6.0±3.0% (total of left and right). (See Fig. 10-34.)

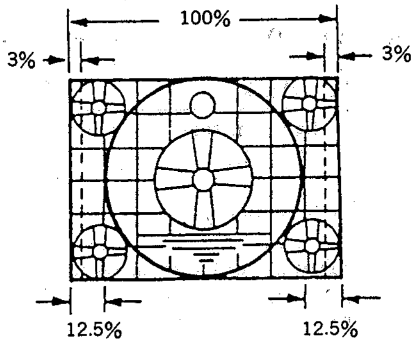
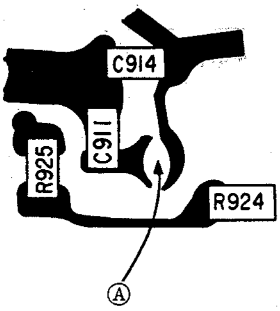


Fig. 10-33.



VF-27 Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 10-34.

10-7-7. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment element	RV902
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning RV902, adjust vertical overscan to 6.0±3.0% (upper and lower total).

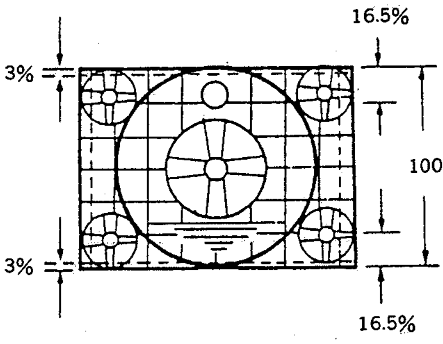


Fig. 10-35.

10-7-8. Brightness, Contrast Adjustments

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment element	Brightness: RV904 Contrast: RV903

[Adjustment Method]

1) Perform brightness and contrast adjustments alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

10-7-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

Values should conform to specifications given in 10-7-6. Horizontal Amplitude Adjustment and 10-7-7. Vertical Amplitude Adjustment. If not. readjust accordingly, and repeat 10-7-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 10-7-3. Focus Adjustment and 10-7-4. Aberration Adjustment.

10-8. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (B TYPE) (VF-26 BOARD)

10-8-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified value	See Fig. 10-37.

[Adjustment Method]

1) Adjust the volume array Ⓓ (BRIGHT) for appropriate brightness on CRT screen. (See Fig. 10-38.)
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 10-36.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

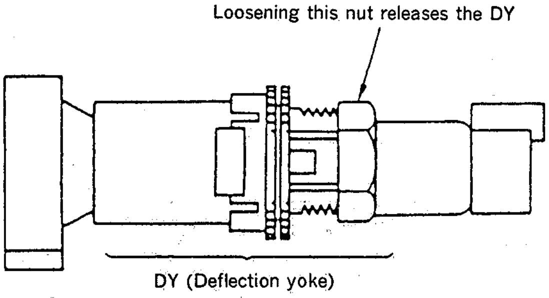
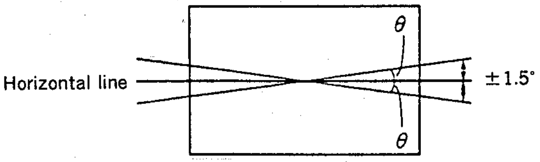

Loosening this nut releases the DY
DY (Deflection yoke)

Fig. 10-36.


θ
Horizontal line
±1.5°
θ

Specified value: Image orientation within ±1.5° of horizontal line.

Fig. 10-37.

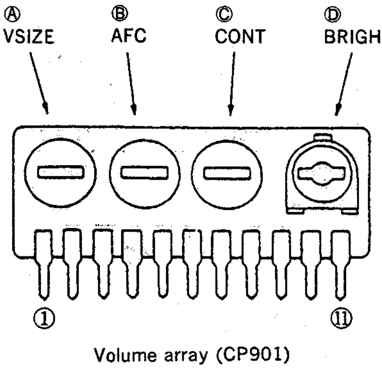

Ⓐ VSIZE
Ⓑ AFC
Ⓒ CONT
Ⓓ BRIGHT
①
⑪
Volume array (CP901)

Fig. 10-38.

10-8-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified value	See Fig. 10-40.

[Adjustment Method]

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 10-39.)

Note: Since the cenering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

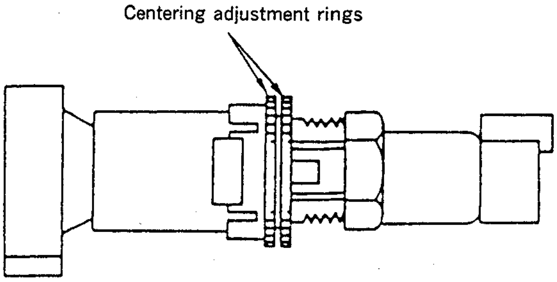

Centering adjustment rings

Fig. 10-39.

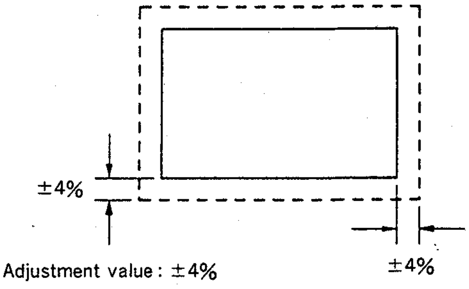

±4%
Adjustment value: ±4%
±4%

Fig. 10-40.

10-8-3. AFC Adjustment

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C915 ⊕ side
Measuring instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment element	Volume array Ⓑ (AFC)
Specified value	$2.6 \pm 0.1V_{DC}$

[Adjustment Method]

1) Adjust volume array Ⓑ (AFC) for $2.6 \pm 0.1V_{DC}$. (See Fig. 10-38.)

10-8-4. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment element	C905
Specified value	6.0±3.0%

[Adjustment Method]

1) Line up the upper and lower section of monoscope image with the upper and lower edges of the screen by rotating volume array Ⓐ (V SIZE). (See Fig. 10-38.)
2) Rotate volume array Ⓓ (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C905) to provide horizontal overscans of 6.0± 3.0% (total of left and right). (See Fig. 10-42.)

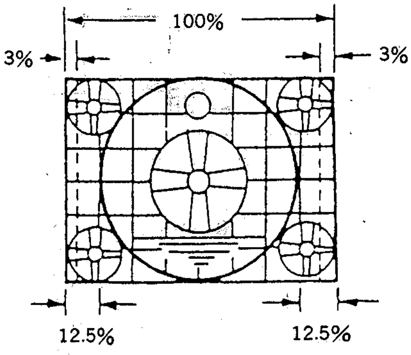
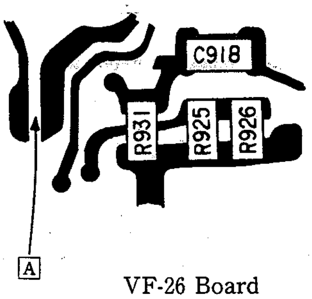


Fig. 10-41.



VF-26 Board
(conductor side)

A section	H size
Open	Large
Short	Small

Fig. 10-42.

10-8-5. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment element	Volume array Ⓐ (V SIZE)
Specified value	6.0±3.0%

[Adjustment Method]

1) By turning volume array Ⓐ (V SIZE), adjust vertical overscan to 6.0±3.0% (upper and lower total). (See Fig. 10-43.)

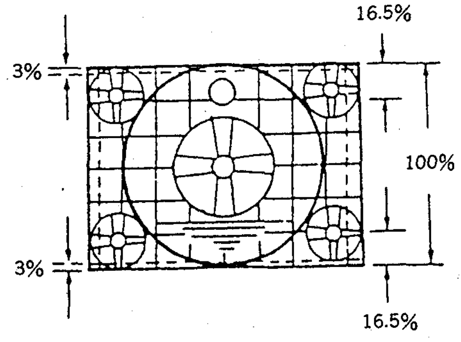

16.5%
3%
100%
3%
16.5%

Fig. 10-43.

10-8-6. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment element	RV901

[Adjustment Method]

1) Adjust to the best focus point with RV901.

10-8-7. Brightness, Contrast Adjustments

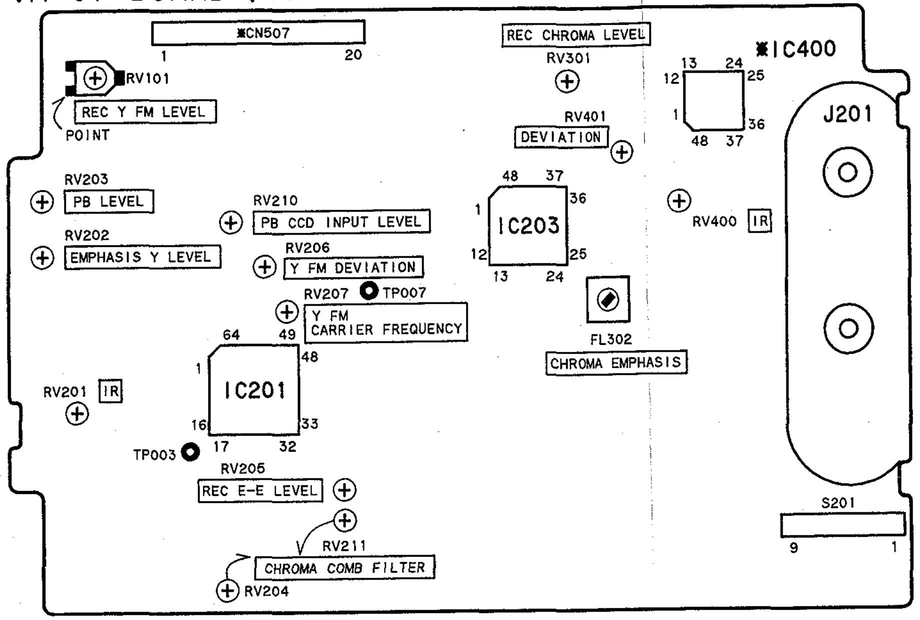
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment element	Brightness: Volume array Ⓓ (BRIGHT) Contrast: Volume array Ⓒ (CONT)

[Adjustment Method]

1) Adjust volume array Ⓓ (BRIGHT) and Ⓒ (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest areas is possible.) (See Fig. 10-38.)

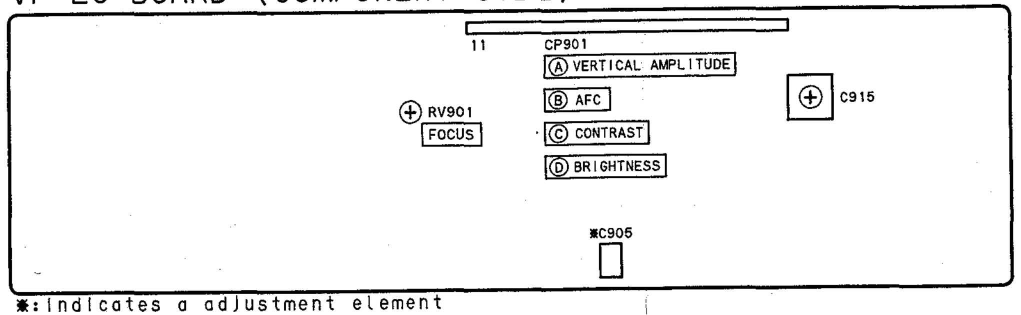
10-9. ADJUSTING PART LOCATION DIAGRAM

VA-67 BOARD (COMPONENT SIDE)


*CN507
1
20
RV101
REC Y FM LEVEL
POINT
REC CHROMA LEVEL
RV301
*IC400
13
24
12
25
1
36
48
37
RV401
DEVIATION
J201
VIDEO
AUDIO
RV203
PB LEVEL
RV202
EMPHASIS Y LEVEL
RV210
PB CCD INPUT LEVEL
RV206
Y FM DEVIATION
RV207
TP007
Y FM CARRIER FREQUENCY
IC203
48
37
1
36
12
25
13
24
RV400
IR
FL302
CHROMA EMPHASIS
IC201
64
49
1
48
16
33
17
32
RV201
IR
TP003
RV205
REC E-E LEVEL
RV211
CHROMA COMB FILTER
RV204
S201
9
1

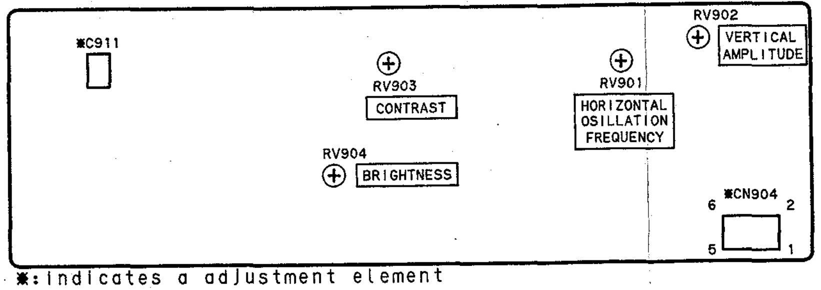
*: Indicates a adjustment element mounted on the conductor side.

VF-26 BOARD (COMPONENT SIDE)


11
CP901
Ⓐ VERTICAL AMPLITUDE
Ⓑ AFC
Ⓒ CONTRAST
Ⓓ BRIGHTNESS
RV901
FOCUS
C915
*C905

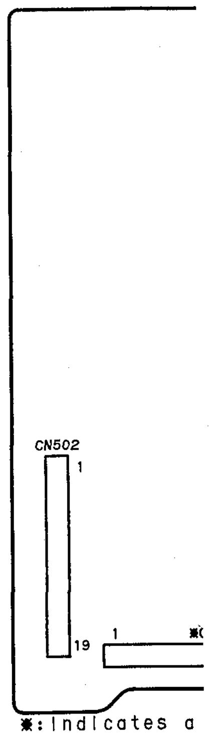
*: Indicates a adjustment element mounted on the conductor side.

VF-27 BOARD (COMPONENT SIDE)


*C911
RV903
CONTRAST
RV904
BRIGHTNESS
RV901
HORIZONTAL OSILLATION FREQUENCY
RV902
VERTICAL AMPLITUDE
*CN904
6
2
5
1

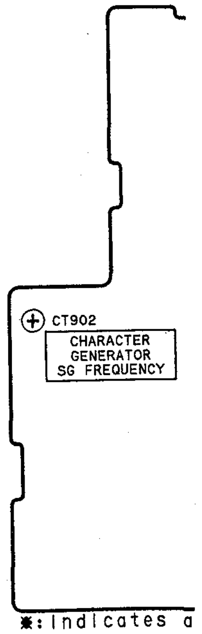
*: Indicates a adjustment element mounted on the conductor side.

SS-136 BO



*: Indicates a
mounted on

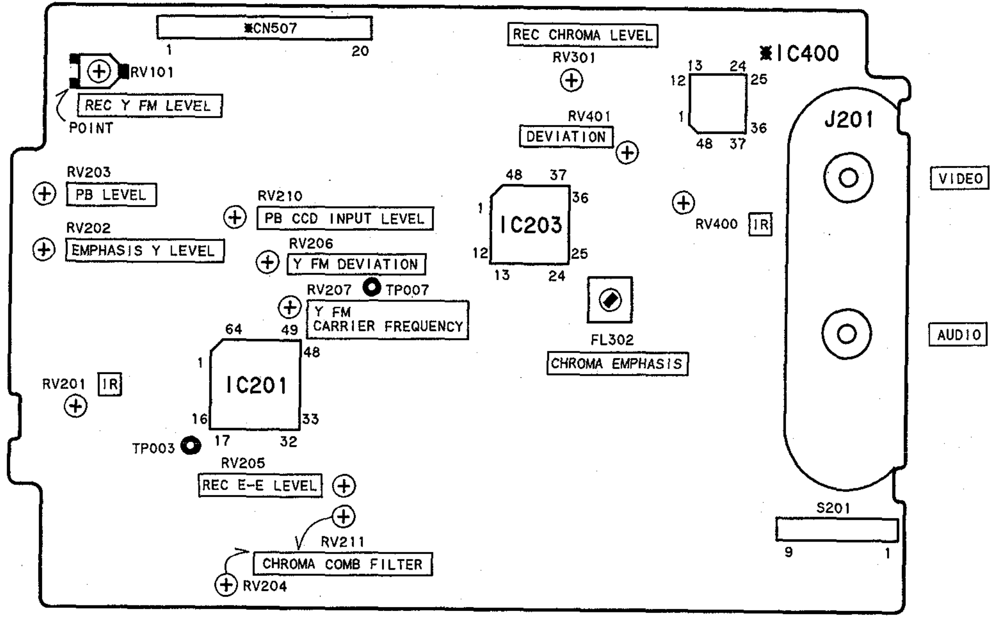
CT-38 BOA


CT902
CHARACTER GENERATOR SG FREQUENCY

*: Indicates a
mounted on

10-9. ADJUSTING PART LOCATION DIAGRAM

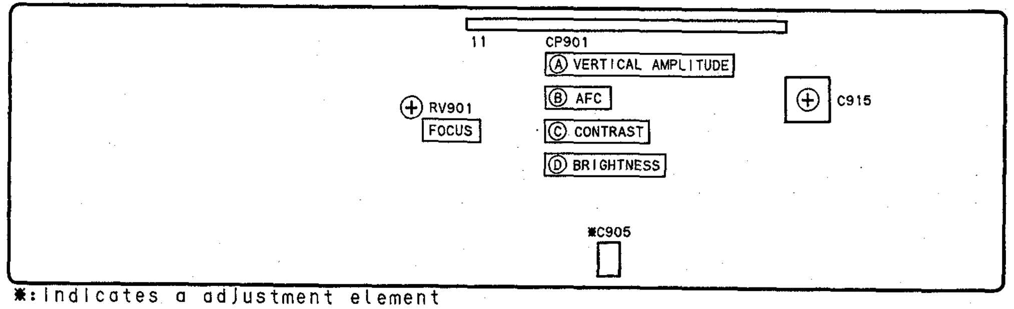
VA-67 BOARD (COMPONENT SIDE)



✱CN507
1
20
RV101
REC Y FM LEVEL
POINT
REC CHROMA LEVEL
RV301
✱IC400
13
24
12
25
1
36
48
37
RV401
DEVIATION
J201
VIDEO
AUDIO
RV203
PB LEVEL
RV202
EMPHASIS Y LEVEL
RV210
PB CCD INPUT LEVEL
RV206
Y FM DEVIATION
48
37
36
IC203
12
25
13
24
RV400
IR
RV207
TP007
Y FM
CARRIER FREQUENCY
64
49
48
IC201
16
33
17
32
FL302
CHROMA EMPHASIS
RV201
IR
TP003
RV205
REC E-E LEVEL
RV211
CHROMA COMB FILTER
RV204
S201
9
1

✱: Indicates a adjustment element mounted on the conductor side.

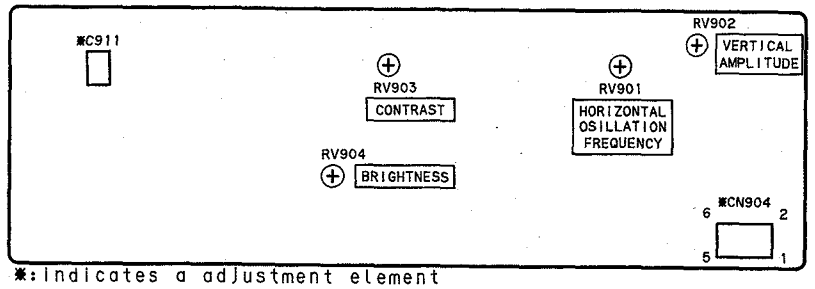
VF-26 BOARD (COMPONENT SIDE)



11
CP901
Ⓐ VERTICAL AMPLITUDE
Ⓑ AFC
Ⓒ CONTRAST
Ⓓ BRIGHTNESS
RV901
FOCUS
C915
✱C905

✱: Indicates a adjustment element mounted on the conductor side.

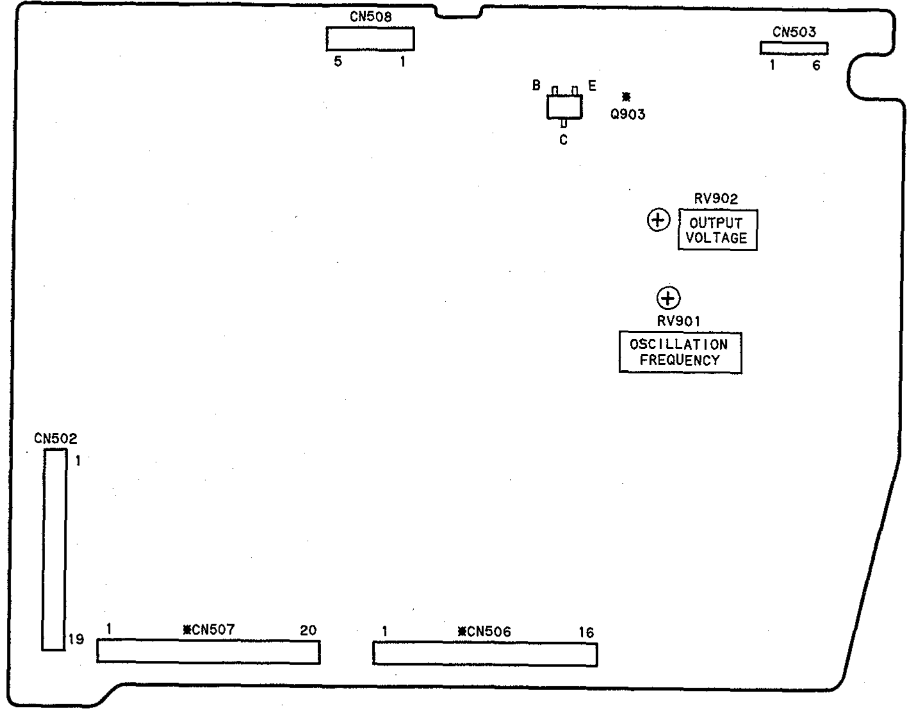
VF-27 BOARD (COMPONENT SIDE)



✱C911
RV903
CONTRAST
RV904
BRIGHTNESS
RV901
HORIZONTAL
OSILLATION
FREQUENCY
RV902
VERTICAL
AMPLITUDE
✱CN904
6
2
5
1

✱: Indicates a adjustment element mounted on the conductor side.

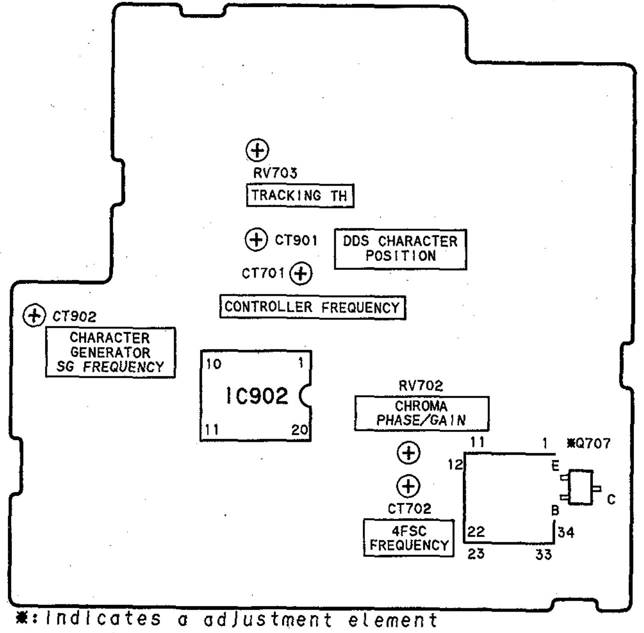
SS-136 BOARD (COMPONENT SIDE)



CN508
5
1
CN503
1
6
B
E
C
✱
Q903
RV902
OUTPUT
VOLTAGE
RV901
OSCILLATION
FREQUENCY
CN502
1
19
1
✱CN507
20
1
✱CN506
16

✱: Indicates a adjustment element mounted on the conductor side.

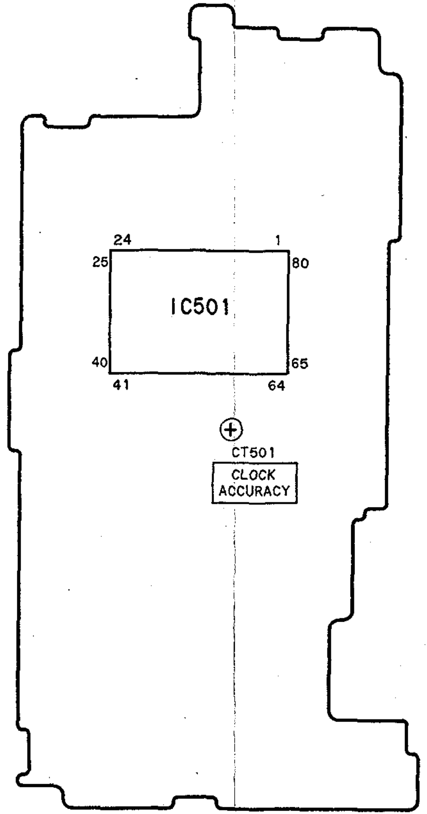
CT-38 BOARD (COMPONENT SIDE)



RV703
TRACKING TH
CT901
DDS CHARACTER
POSITION
CT701
CONTROLLER FREQUENCY
CT902
CHARACTER
GENERATOR
SG FREQUENCY
10
1
IC902
11
20
RV702
CHROMA
PHASE/GAIN
11
1
✱Q707
12
E
C
B
22
34
23
33
CT702
4FSC
FREQUENCY

✱: Indicates a adjustment element mounted on the conductor side.

FU-100 BOARD (COMPONENT SIDE)



24
1
25
80
IC501
40
65
41
64
CT501
CLOCK
ACCURACY

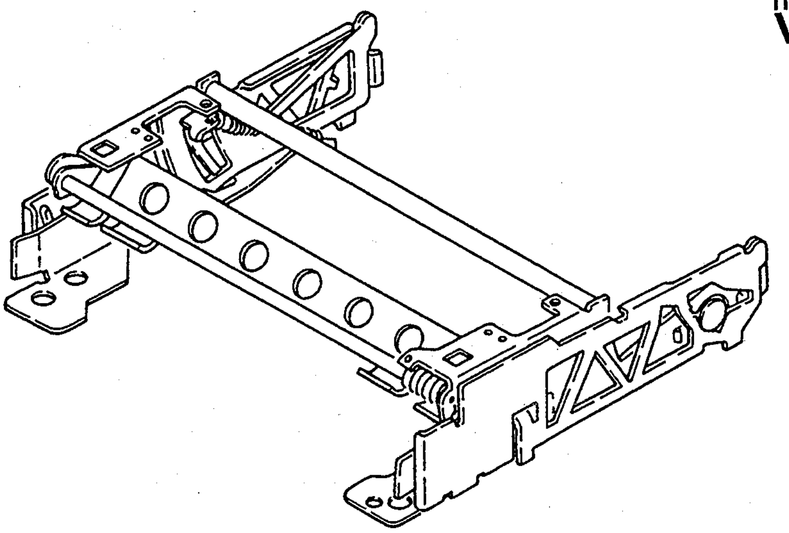
8mm Video MECHANICAL ADJUSTMENT MANUAL II

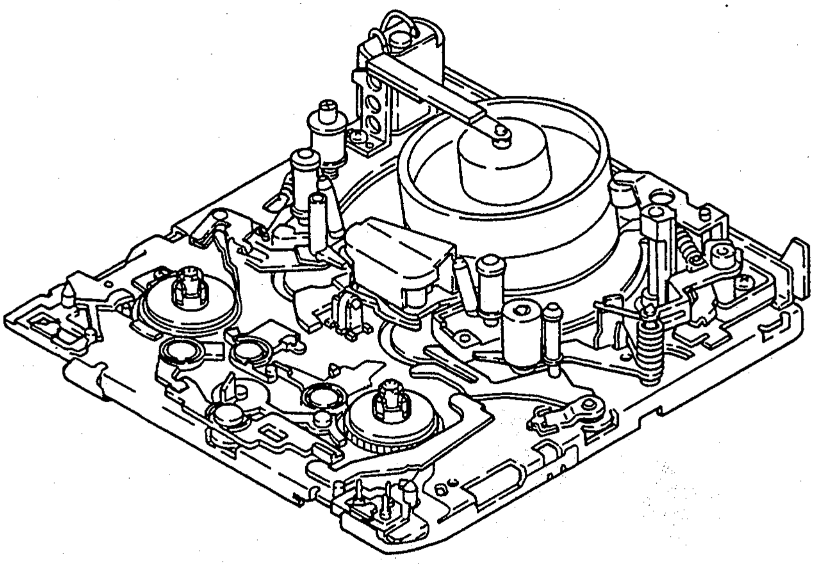
U MECHANISM

Video 8

Please use in conjunction with the SERVICE MANUAL.

V01571





8 MECHANISM DECK

SONY®

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2. PERIODICAL CHECK AND MAINTENANCE

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1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette compartment, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE COMPARTMENT ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1.)

1) Supply power to the unit after removing the cabinet, the camera block, the cassette compartment assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck.)
2) Cover the LED assembly with an opaque cap, etc. ❶.
3) Attach a piece of tape to the RECOG switch ❷ so that the pin is held down.
4) Push the EJECT lever ❸ in the direction of the arrow Ⓐ.

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

1) Follow the procedures in section 1-1-1. above.
2) Put the rubber band ❹ around the S and T reels.
3) Press the PLAY switch of unit, then push the tension regulator arm assembly ❺ in the direction of the arrow Ⓑ when the T reel starts to rotate (the tension regulator band will be released, and the S reel will start rotating).
4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1.)

1) To eject, turn the EJECT switch on.

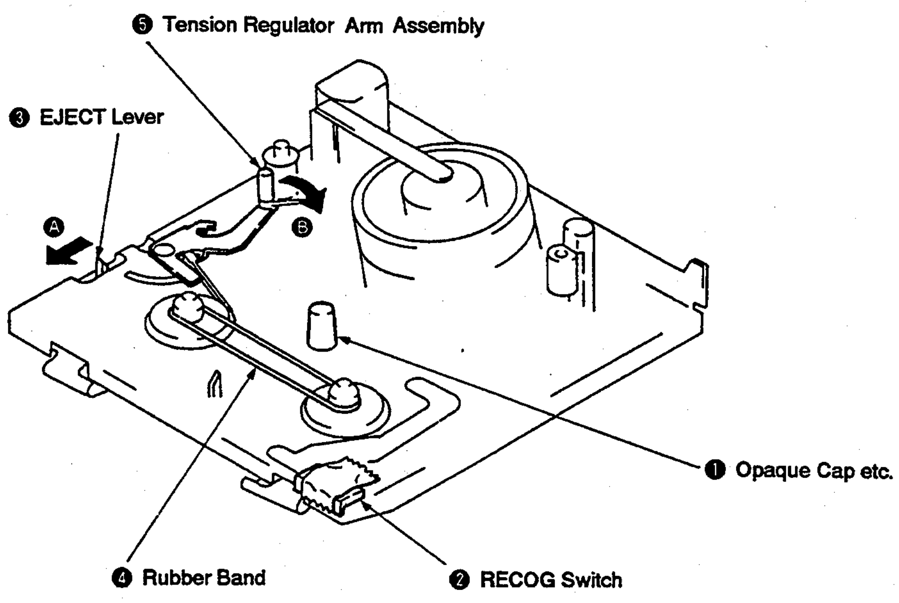


Fig. 1-1.

1-2. THE MODE SELECTOR

1-2-1. Name of Each Part (external) (See Fig. 1-2.)

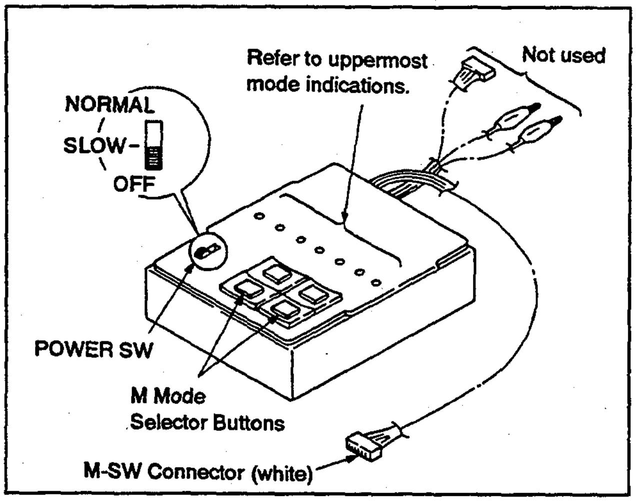

Refer to uppermost mode indications.
Not used
NORMAL
SLOW
OFF
POWER SW
M Mode Selector Buttons
M-SW Connector (white)

Fig. 1-2.

1-2-2. Connections (See Fig. 1-3.)

1) Mount the MODE SELECTOR III panel (Ref. No. J-9) ❶ onto the mode selector.
2) Attach the conversion connector (Ref. No. J-8) ❸ of MODE SELECTOR III to the 6-pin connector (white) ❷ of the mode selector M-SW.
3) Remove the FP-89 flexible board ❺ from the flexible connector ❹.
4) Attach the FP-89 flexible board ❺ to the flexible connector ❻ of the MODE SELECTOR III conversion connector ❸, then attach the 2-pin connector (white) ❽ of the loading motor to the 2-pin connector (white) ❼.

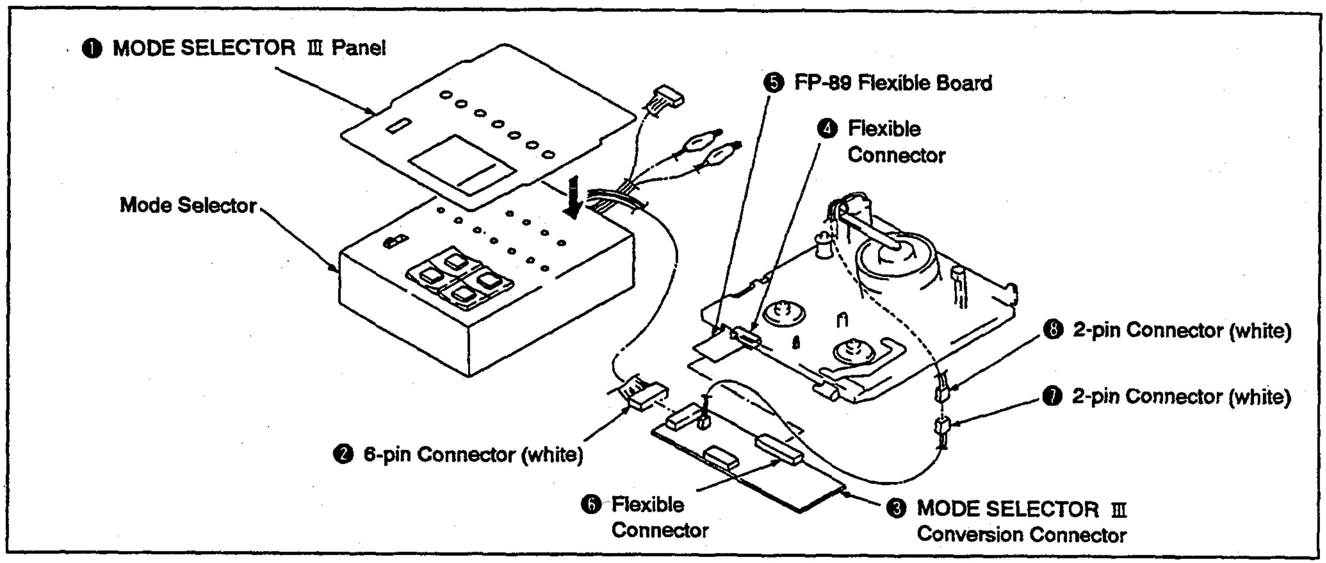

❶ MODE SELECTOR III Panel
Mode Selector
❺ FP-89 Flexible Board
❹ Flexible Connector
❽ 2-pin Connector (white)
❼ 2-pin Connector (white)
❷ 6-pin Connector (white)
❻ Flexible Connector
❸ MODE SELECTOR III Conversion Connector

Fig. 1-3.

1-2-3. Handling (See Figs. 1-2. and 1-4.)

- Use only the M mode selector buttons.
- Refer to mode indications on the uppermost part of the MODE SELECTOR III panel.
- If the right M mode selector button is kept pressed, the lit indication will change in the order of EJECT → (IA) → ULD → (IB) → STOP → (IC) → FWD.
- To change modes in the reverse direction (from FWD to EJECT), press the left selector button.

Note: For this U mechanism, the uppermost indicators on the MODE SELECTOR III panel are used. The IA, IB and IC indications light up during mode changes.

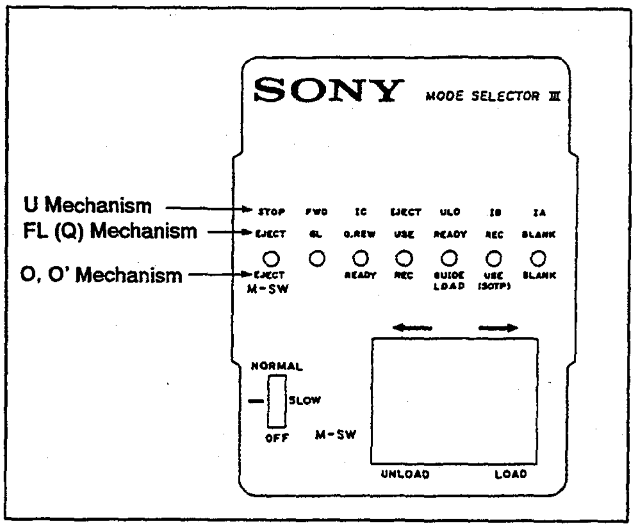

SONY
MODE SELECTOR III
U Mechanism
FL (Q) Mechanism
O, O' Mechanism
STOP
FWD
IC
EJECT
ULD
IB
IA
EJECT
SL
Q.REW
USE
READY
REC
BLANK
EJECT
M-SW
READY
REC
GUIDE LOAD
USE (SOTP)
BLANK
NORMAL
SLOW
OFF
M-SW
UNLOAD
LOAD

Fig. 1-4.

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1.)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

1) While pressing a piece of chamois leather (Ref. No. J-2) moistened in cleaning fluid (Ref. No. J-1) lightly against the rotary drum, turn the rotary upper drum slowly counter-clockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise.
Do not move the chamois leather vertically against the head tip; this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

1) Set the cassette compartment assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch rollers) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

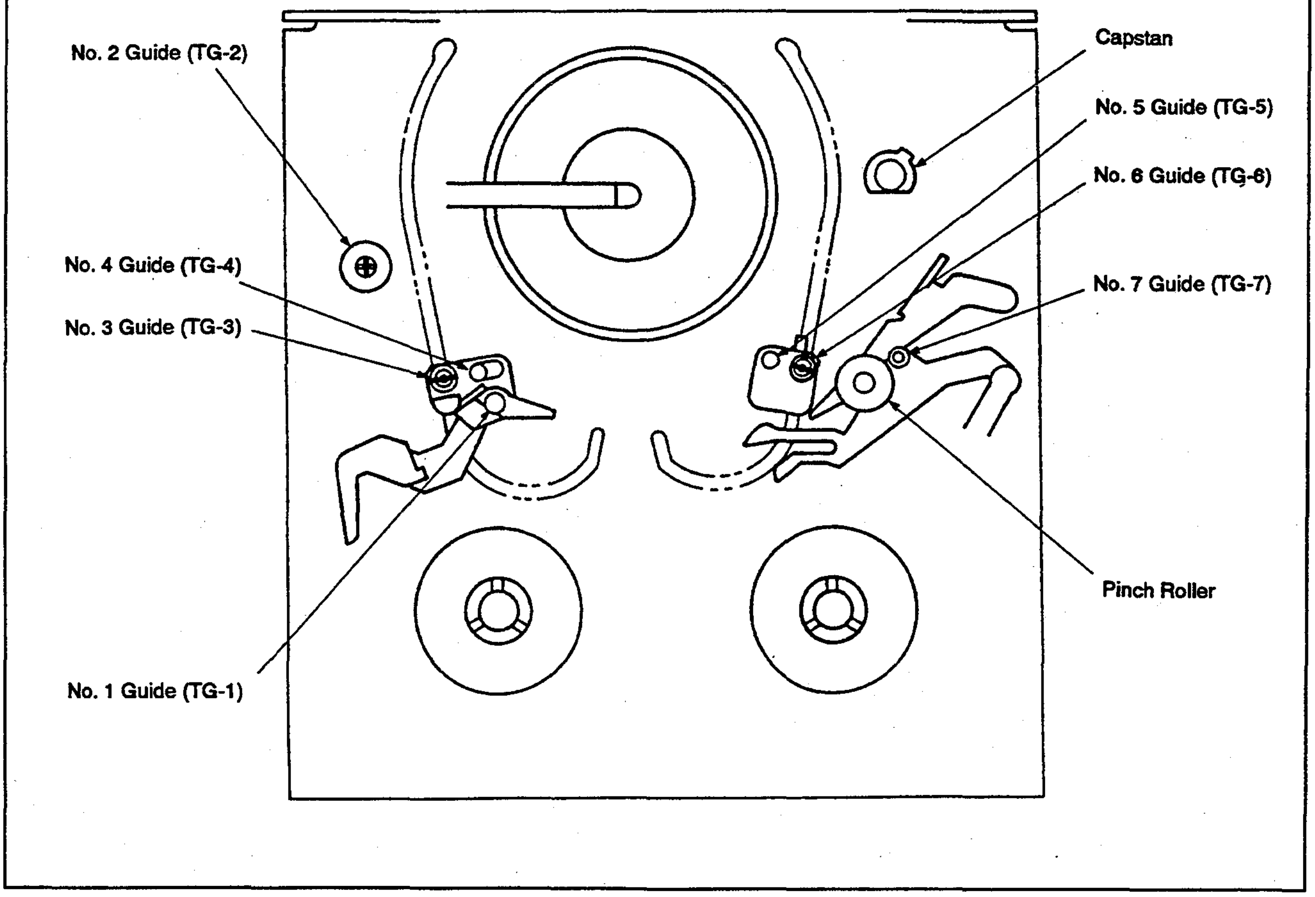


Fig. 2-1.

2-4. PERIODICAL CHECK ITEMS

○Cleaning ◎Lubrication ☆Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demagnetizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil.
Drive System	Relay belt (short)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-866-01
	Relay belt (long)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-865-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	1-541-612-11
Performance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD, RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

Notes: When overhauling the unit, perform parts replacement referring to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds).
  Specified oil: Part No. 7-661-018-01
  (Mitsubishi Diamond Oil Hydrofluid EP56)
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
  Grease: Part No. 7-662-010-08
  (Sony grease SGL-701)

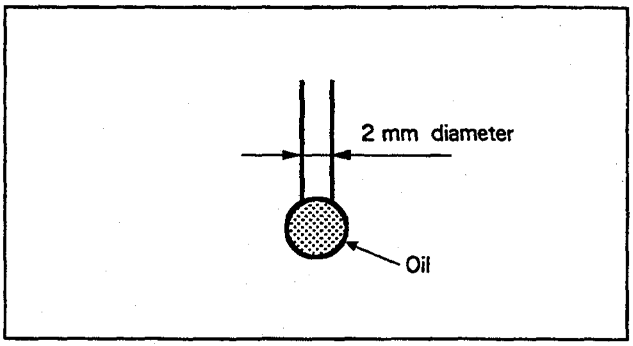


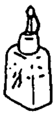
Fig. 2-2.

2-5. SERVICING TOOLS

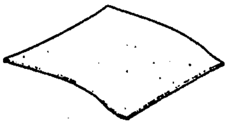
Ref. No.	Name	Part Code	Marking	Application, etc.
J-1	Cleaning fluid	Y-2031-001-0	–	
J-2	Chamois cloth	2-034-697-00	–	
J-3	Head demagnetizer	Commercially available	–	
J-4	Dental mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	FWD/RVS takeup torque cassette	J-6080-824-A	GD-2086	
J-7	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-8	Mode selector III conversion connector	J-6082-021-A		General
J-9	Mode selector III panel	J-6082-023-A		General
J-10	Mode selector	J-6080-825-A		General
J-11	Hexagonal wrench detection (0.89 mm) or L wrench (0.89 mm)	7-700-766-01 7-700-736-06		Tape path
J-12	Sony grease (SGL-701)	7-662-010-08		

Other devices: Oscilloscope
Analog tester (20 kΩ)

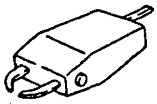
J-1



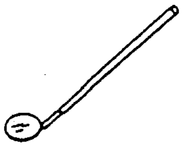
J-2



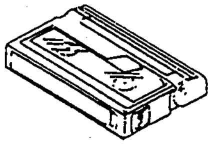
J-3



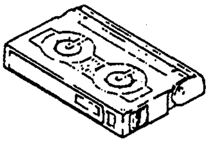
J-4



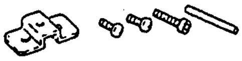
J-5



J-6

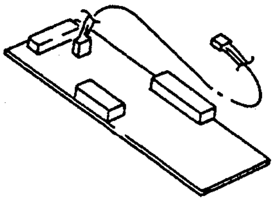


J-7

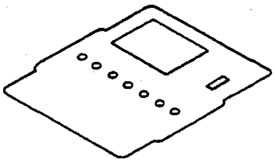


(Attached to the maintenance rotary upper drum)

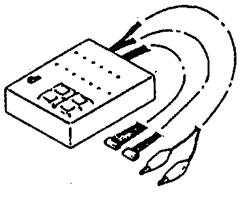
J-8



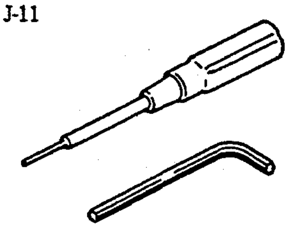
J-9



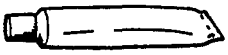
J-10



J-11



J-12



3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Notes:
- Use the mode selector (Ref. No. J-10) for procedures in this chapter.
- Modes within a frame ☐ are those set by pressing the buttons of the mode selector.

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

1) Remove the screw ❶, then remove the HC roller assembly ❷.

2. Installation (See Fig. 3-1.)

1) Align the two dowels ❸ attached to the HC roller assembly ❷ with the two holes ❹ in the mechanism chassis.
2) Secure the HC roller assembly ❷ with the screw ❶.

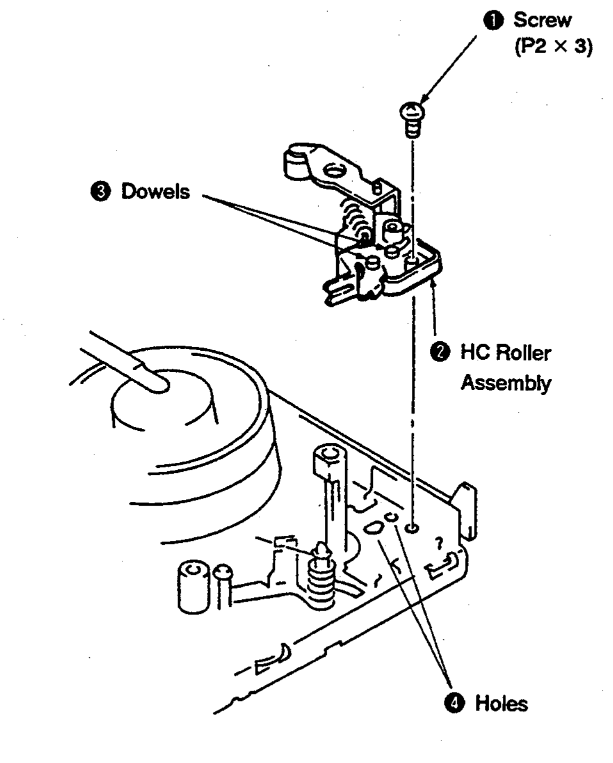

❶ Screw
(P2 × 3)
❸ Dowels
❷ HC Roller Assembly
❹ Holes

Fig. 3-1.

3-2. GUIDE GUARD ASSEMBLY

1. Removal (See Fig. 3-2.)

Remove the screw ❶, then remove the guide guard assembly ❷.

2. Installation (See Fig. 3-2.)

1) Align the dowel ❸ attached to the guide guard assembly ❷ with the hole ❹.
2) Secure the guide guard assembly ❷ with the screw ❶.

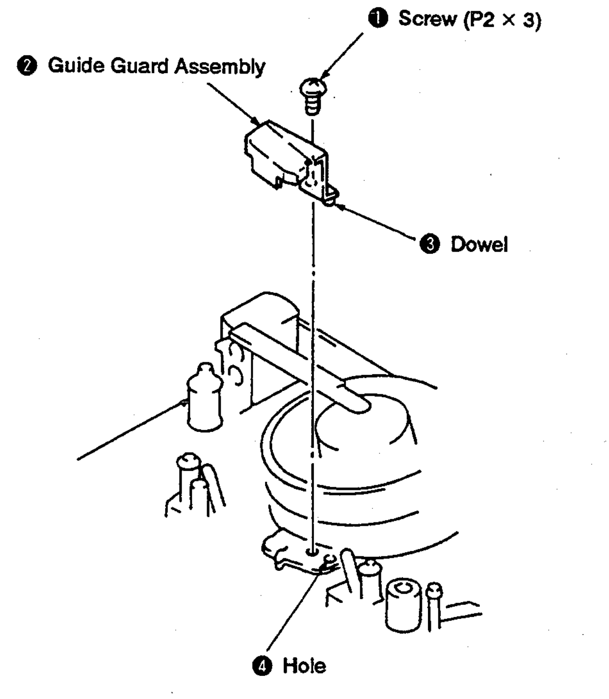

❶ Screw (P2 × 3)
❷ Guide Guard Assembly
❸ Dowel
❹ Hole

Fig. 3-2.

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

1) Set the ULD mode.
2) Turn the stopper ❶ in the direction of the arrow Ⓐ as far as it will go.
3) Remove the two screws ❷, then remove the DC motor ❸.

2. Installation (See Fig. 3-3.)

1) Align the two screwed dowels ❹ with the two holes ❺, then engage the toothed part ❻ with the connecting gear ❼.
2) Secure the DC motor assembly ❸ with the two screws ❷.
3) Turn the stopper ❶ in the direction of the arrow Ⓑ as far as it will go.

Note:
- When engaging the gears, take care not to damage their teeth.
- Do not leave any clearance between the DC motor ❸ and the chassis.
- Do not touch the capstan motor axle*, the oil seal* and the rotor*.

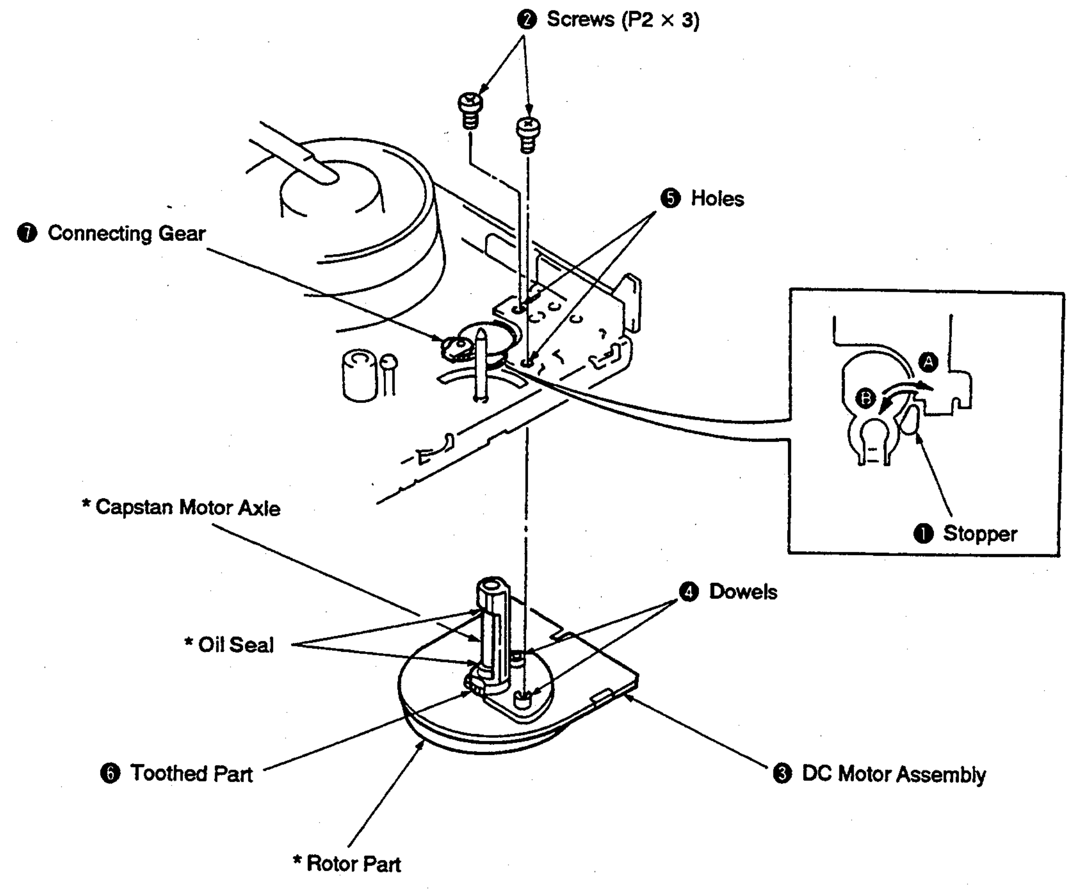

❷ Screws (P2 × 3)
❺ Holes
❼ Connecting Gear
Ⓐ
Ⓑ
❶ Stopper
* Capstan Motor Axle
❹ Dowels
* Oil Seal
❻ Toothed Part
❸ DC Motor Assembly
* Rotor Part

Fig. 3-3.

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

1) Remove the torsion coil spring (ST) ❶.
2) Remove the axle holding pin ❷, then remove the T brake ❸.
3) Remove the axle holding pin ❹, then remove the S brake ❺.

2. Installation (See Fig. 3-4.)

1) While fitting the toothed part ❻ into the notch ❼, mount the S brake ❺.
2) Insert the axle holding pin ❹.
3) Insert the axle ❽ to the S reel side of the brake release arm ❾ so that the Ⓐ part comes closer to the drum than part Ⓑ, and mount the T brake ❸.
4) Insert the axle holding pin ❷.
5) Insert the torsion coil spring (ST) ❶ below the claw ⓫ of the axle ❿, then hook it to two claws ⓬.

Note: Confirm that the claws of axle holding pins ❷ and ❹ are not broken before assembling.

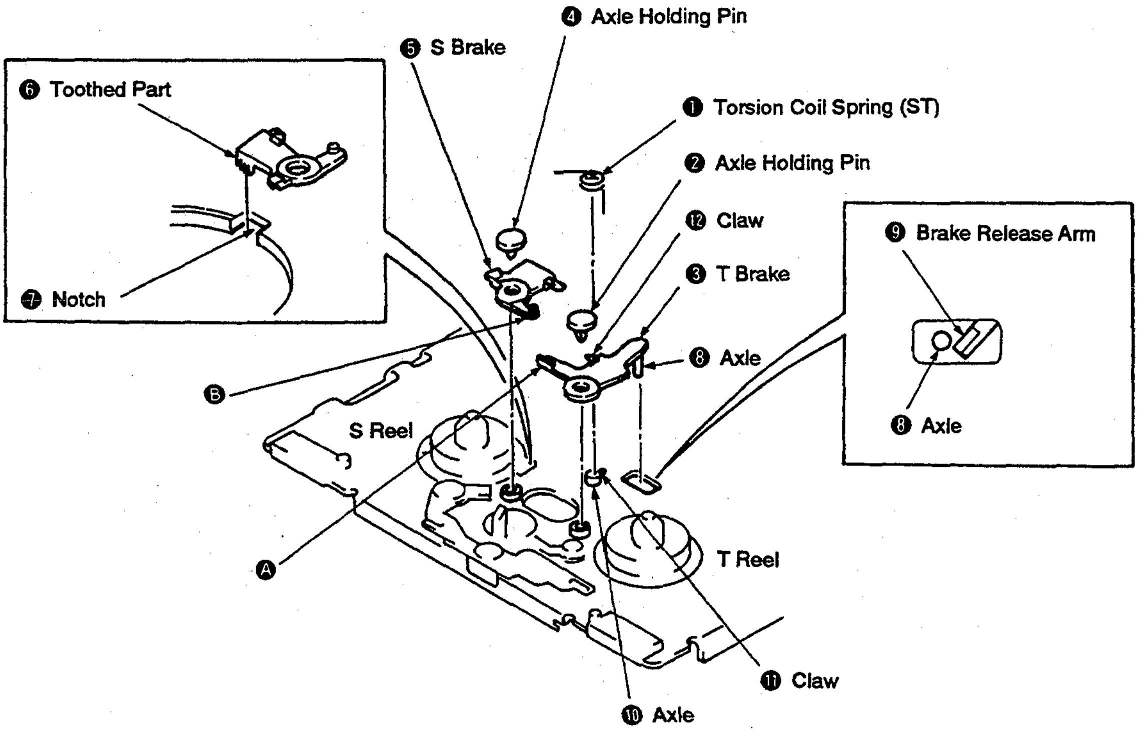

❹ Axle Holding Pin
❺ S Brake
❻ Toothed Part
❶ Torsion Coil Spring (ST)
❷ Axle Holding Pin
⓬ Claw
❾ Brake Release Arm
❼ Notch
❸ T Brake
❽ Axle
Ⓑ
S Reel
❽ Axle
Ⓐ
T Reel
⓫ Claw
❿ Axle

Fig. 3-4.

3-5. LB BRAKE, AXLE HOLDING PINS

1. Removal (See Fig. 3-5.)

1) Remove the screw ❶, then remove the TL holding plate ❷.
2) Remove the axle holding pin ❸, then remove the LB brake ❹.
3) Remove the axle holding pin ❺, then remove the LB lever ❻.

2. Installation (See Fig. 3-5.)

1) Mount the LB lever ❻ matching it to pin ❼ of the LB gear, then secure it with the axle holding pin ❺.
2) Insert the pin ❽ into the notch ❾ of the LB lever ❻, then mount the LB brake ❹ while inserting the toothed part ❿ into the notch ⓫.
3) Insert the axle holding pin ❸.
4) Align the dowel ⓬ with the hole ⓭, then mount the TL holding plate and secure it with the screw ❶.

Note: Confirm that the claws of axle holding pins ❸ and ❺ are not broken before assembling.

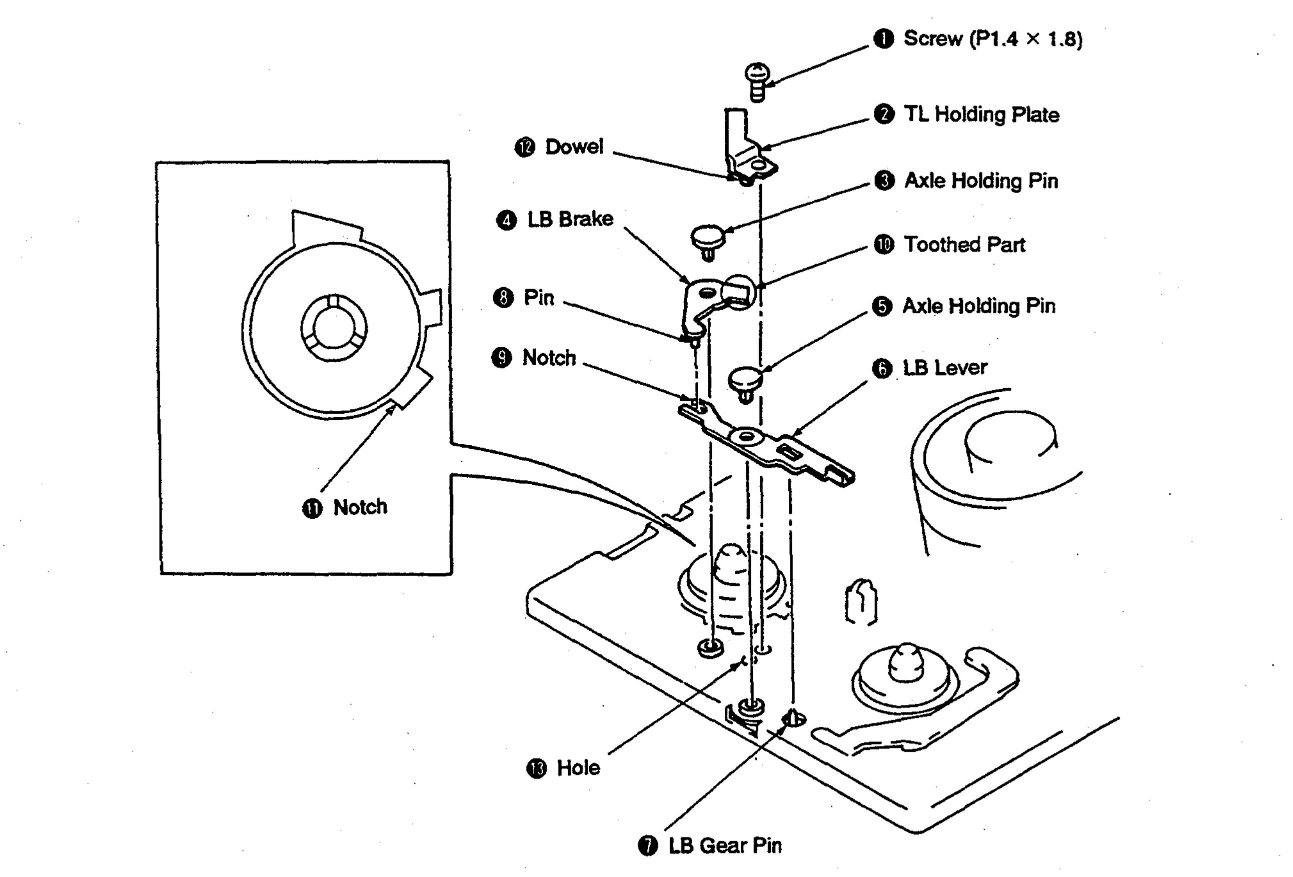

❶ Screw (P1.4 × 1.8)
❷ TL Holding Plate
⓬ Dowel
❸ Axle Holding Pin
❹ LB Brake
❿ Toothed Part
❽ Pin
❺ Axle Holding Pin
❾ Notch
❻ LB Lever
⓫ Notch
⓭ Hole
❼ LB Gear Pin

Fig. 3-5.

3-6. LB RELEASE ARM

1. Removal (See Fig. 3-6.)

1) While pushing the claw ❶ in the direction of the arrow, remove the LB release arm ❷.

2. Installation (See Fig. 3-6.)

1) Fit the LB release arm ❷ to the axle ❸, insert protrusions ⓐ, ⓑ, ⓒ, ⓓ into the three holes ❹, then secure with the claw ❶.

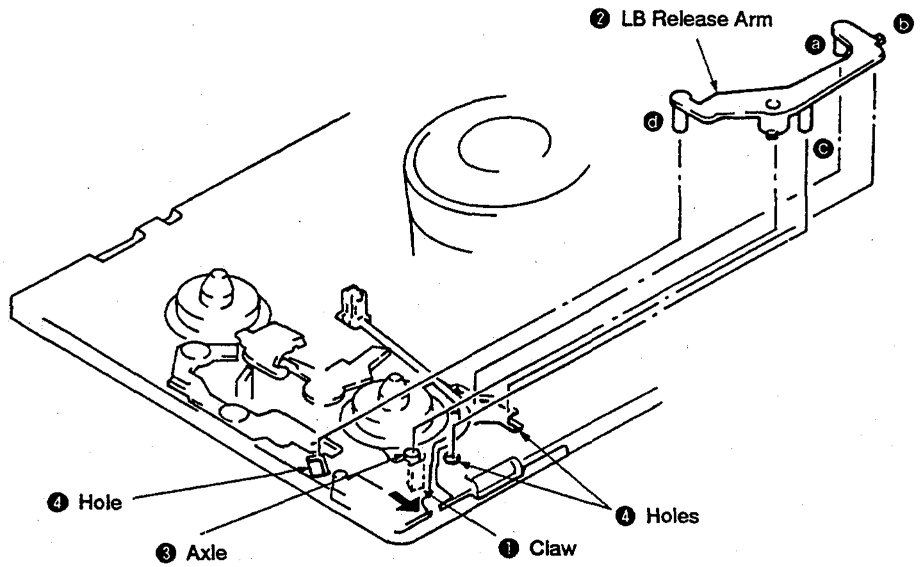

❷ LB Release Arm
ⓐ
ⓑ
ⓒ
ⓓ
❹ Hole
❸ Axle
❹ Holes
❶ Claw

Fig. 3-6.

3-7. RK STOPPER, RK STOPPER ARMS

1. Removal (See Fig, 3-7.)

1) Remove the torsion coil spring (RK) ❶.
2) Open the chassis claw ❷, then remove the RK stopper arm ❸.
3) Remove the RK stopper ❹.

2. Installation (See Fig. 3-7.)

1) Mount the RK stopper ❹ onto the axle ❺.
2) Mount the RK stopper arm ❸ onto the axle ❻, insert Pin ❿ into hole ⓫, then hook the claw ❷ of the chassis to the hole ❼.
3) Insert the torsion coil spring (RK) ❶ into the axle ❺, then hook it to claws ❽ and ❾.

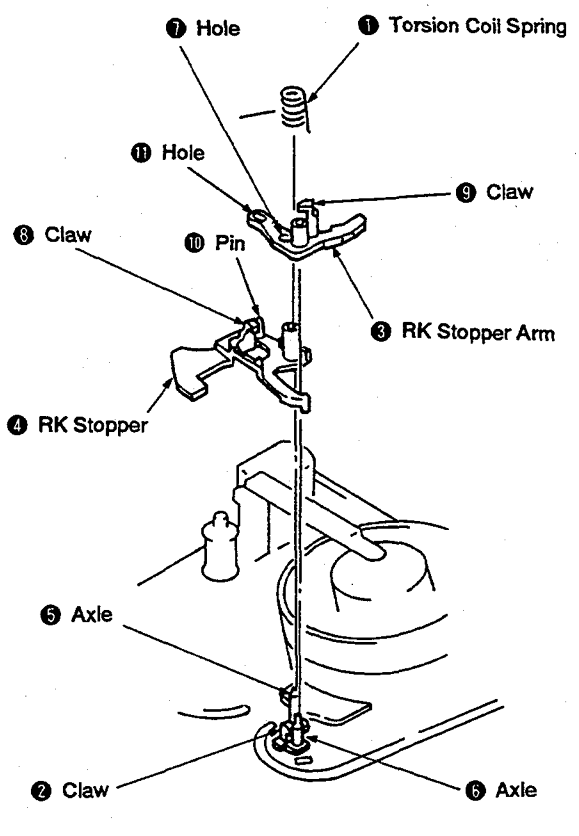

❼ Hole
❶ Torsion Coil Spring
⓫ Hole
❾ Claw
❽ Claw
❿ Pin
❸ RK Stopper Arm
❹ RK Stopper
❺ Axle
❷ Claw
❻ Axle

Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, TG-7 ASSEMBLY

1. Removal (See Fig. 3-8.)

1) Set the IB mode.
2) Remove the stopper washer ❶, then remove the pinch arm assembly ❷.
3) Bend the claw ❹ inside hole ❸ in the direction of the arrow using a thin screwdriver or the like, then remove the TG-7 plate spring ❺.
4) Remove the TG-7 arm assembly ❻.

2. Installation (See Fig. 3-8.)

1) Grease the inner surfaces of hole ❼ (See Fig. A).
2) Insert the axle ❽ of the TG-7 arm assembly ❻ into the hole ❼.
3) Grease the shaded section ⓐ (See Fig. A).
4) Insert the TG-7 plate spring ❺ into the hole ❸, then secure it with the claw ❹.
5) Apply half a drop of oil to the axle ❾ (See Fig. B).
6) Fit the pinch arm assembly ❷ to the axle ❾ and insert the pinch roller sub arm assembly tab ❿ into the ⓑ part.
7) Install the stopper washer ❶.

Note:
- Take care not to grease the screw ⓫ of the TG-7 arm assembly ❻ (See Fig. A).
- When fitting the pinch arm assembly ❷ to the axle ❾, make sure that it does not touch the TG-7 guide ⓬ or the rubber roller ⓭.
- After assembling, be sure to perform tape path adjustment as described in section 4.

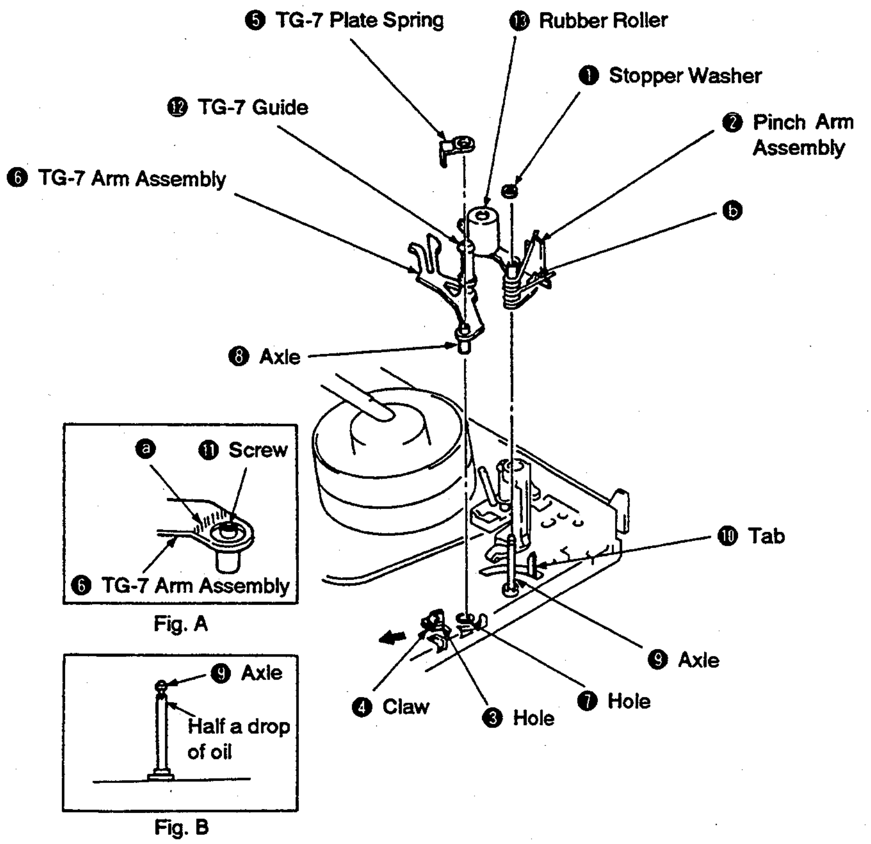

❺ TG-7 Plate Spring
⓭ Rubber Roller
❶ Stopper Washer
⓬ TG-7 Guide
❷ Pinch Arm Assembly
❻ TG-7 Arm Assembly
ⓑ
❽ Axle
ⓐ
⓫ Screw
❻ TG-7 Arm Assembly
Fig. A
❿ Tab
❾ Axle
Half a drop of oil
Fig. B
❾ Axle
❹ Claw
❸ Hole
❼ Hole

Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Removal (See Fig. 3-9.)

1) Remove the TG-2 upper flange assembly ❶.
2) Remove the TG-2 roller ❷, the TG-2 sleeve ❸, the TG-2 lower flange ❹ and the compression spring ❺.

2. Installation (See Fig. 3-9.)

1) Mount the compression spring ❺, the TG-2 lower flange ❹, the TG-2 sleeve ❸ and the TG-2 roller ❷ to the axle.
2) Secure the TG-2 upper flange ❶ to the axle by rotating it 4 to 6 turns.

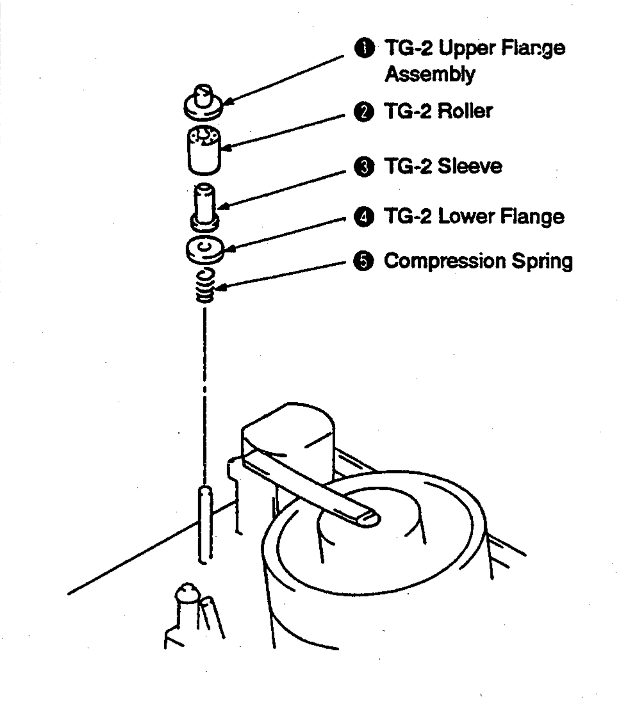

❶ TG-2 Upper Flange Assembly
❷ TG-2 Roller
❸ TG-2 Sleeve
❹ TG-2 Lower Flange
❺ Compression Spring

Fig. 3-9.

3. TG-2 Height Preset (see Fig. 3-10.)

1) Adjust height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by turning the TG-2 upper flange ❶.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

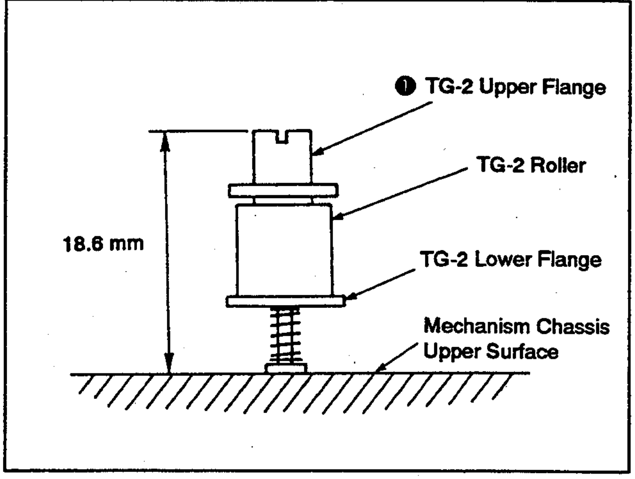

❶ TG-2 Upper Flange
TG-2 Roller
18.6 mm
TG-2 Lower Flange
Mechanism Chassis Upper Surface

Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY, T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

1) Remove the S brake and T brake as described in section 3-4.
2) Remove the TL holding plate as described in section 3-5.
3) Remove the tension regulator band assembly as described in section 3-11.
4) Remove the S reel table assembly ❶.
5) Turn the stopper ❷ approx. 90 ° in the direction of the arrow Ⓐ.
6) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, remove the T reel table assembly ❹.

2. Installation (See Fig. 3-11.)

1) Apply half a drop of oil to the axle ❺ (See Fig. A).
2) Move the RK gear ❻ in the direction of the arrow Ⓒ and the TS brake ❼ in the direction of the arrow Ⓓ, putting them out of the way.
3) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, mount the T reel table assembly ❹ onto the axle ❺, then turn the stopper ❷ in the direction of the arrow Ⓔ as far as it will go.
4) Apply half a drop of oil to the axle ❽ (See Fig. B).
5) Move the RK gear ❻ in the direction of the arrow Ⓕ, the UL brake ❾ in the direction of the arrow Ⓖ and the LB brake ❿ in the direction of the arrow Ⓗ, putting them out of the way.
6) Mount the S reel table ❶ onto the axle ❽.
7) Mount the tension regulator band assembly as described in section 3-11.
8) Mount the TL holding plate as described in section 3-5.
9) Mount the S brake and T brake assemblies as described in section 3-4.

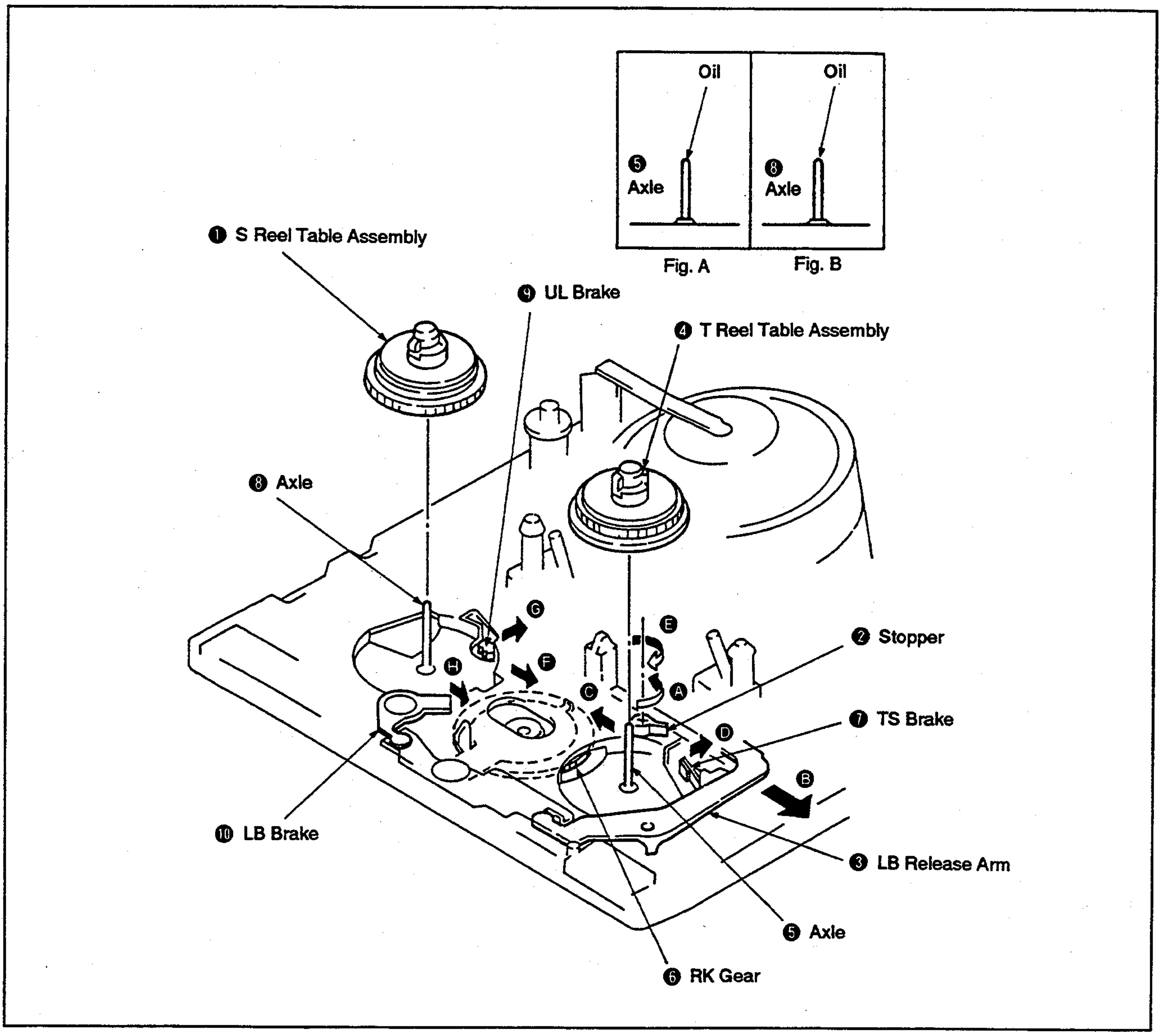

Oil
Oil
❺ Axle
❽ Axle
Fig. A
Fig. B
❶ S Reel Table Assembly
❾ UL Brake
❹ T Reel Table Assembly
❽ Axle
Ⓖ
Ⓔ
❷ Stopper
Ⓗ
Ⓕ
Ⓒ
Ⓐ
❼ TS Brake
Ⓓ
Ⓑ
❿ LB Brake
❸ LB Release Arm
❺ Axle
❻ RK Gear

Fig. 3-11.

3-11. TENSION REGULATOR BAND ASSEMBLY, TENSION REGULATOR ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

1) Remove the TL holding plate as described in section 3-5.
2) Remove the screw ❶.
3) Using a thin screwdriver or the like, remove the tension regulator band assembly ❹ from the axle ❸ of tension regulator arm assembly ❷.
4) Remove the tension spring ❺.
5) Remove the stopper washer ❻ from the back of the mechanism chassis, then remove the tension regulator arm assembly ❷.
6) Open the claw ❼, then remove the adjust arm ❽.

Note: When removing the tension regulator band assembly ❹, take care not to twist or bend it, and not to touch the felt surface ❾.

2. Installation (See Fig. 3-12.)

1) Engage the adjust arm ❽ in the position shown in Fig. A, then close the claw ❼.
2) Apply half a drop of oil to the hole ❿.
3) Mount the tension regulator arm assembly ❷, then insert it into the slot ⓫ so that the ⓐ part comes to the arrow Ⓐ side of the switch lever assembly (See Fig. B).
4) While holding the tension regulator arm assembly ❷ from the mechanism chassis front, secure it with the stopper washer ❻ from the back.
5) Hook the R hook of the tension spring ❻ to the adjust arm ❽ as shown in the figure, then hook the opposite end to the tension regulator arm assembly ❷.
6) Mount the tension regulator band assembly ❹ onto the axle ❸ of tension regulator arm assembly ❷, and place it so that the felt surface ❾ comes against the shaded portion of the S reel table assembly ⓬.
7) Mount the tension regulator plate ⓭ of the tension regulator band assembly ❹ so that it is aligned with the dowel ⓮ of the mechanism chassis, then secure it temporarily with the screw ❶.
8) Mount the TL holding plate as described in section 3-5.
9) Adjust tension regulator FWD position as described in section 3-12.
10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the tension regulator band assembly ❷, take care not to twist or bend it, and not to touch the felt surface ❾.

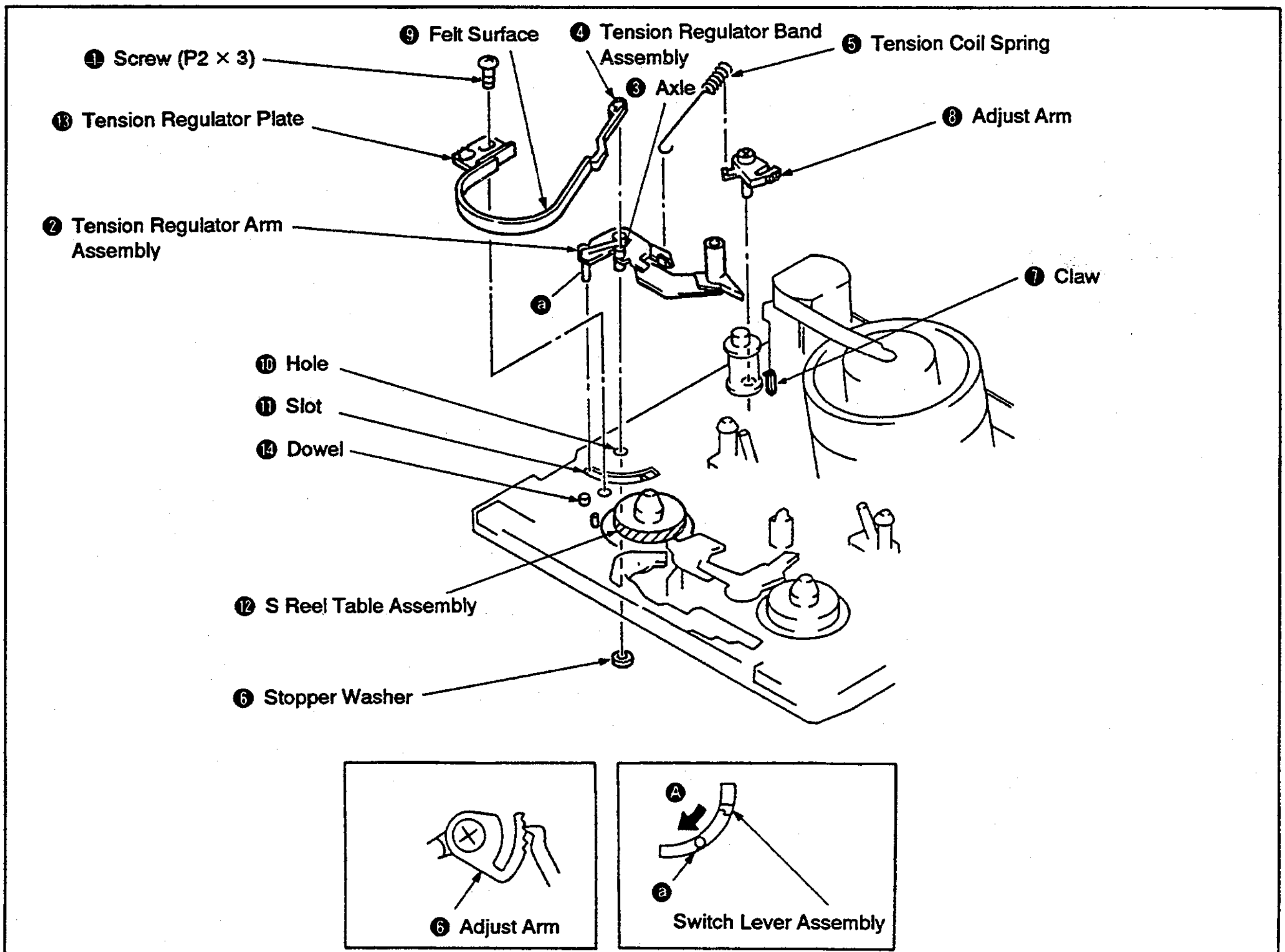

❶ Screw (P2 × 3)
❾ Felt Surface
❹ Tension Regulator Band Assembly
❺ Tension Coil Spring
❸ Axle
⓭ Tension Regulator Plate
❽ Adjust Arm
❷ Tension Regulator Arm Assembly
ⓐ
❼ Claw
❿ Hole
⓫ Slot
⓮ Dowel
⓬ S Reel Table Assembly
❻ Stopper Washer
❽ Adjust Arm
Ⓐ
ⓐ
Switch Lever Assembly

Fig. A

Fig. B

Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13.)

1) Load a cassette tape and set the FWD mode.
2) Confirm whether the distance between ⓐ part of the tension regulator arm ❶ and the groove ❷ of the chassis is 1.1 ± 0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
3) Loosen the fixing screw ❹ of the tension regulator band assembly ❸.
4) Slide the tension regulator plate ❺ in the direction of the arrow Ⓐ if the measured distance is over the specified range, and in the direction of the arrow Ⓑ if it is under that range. Then, fix it with the screw ❹.
5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

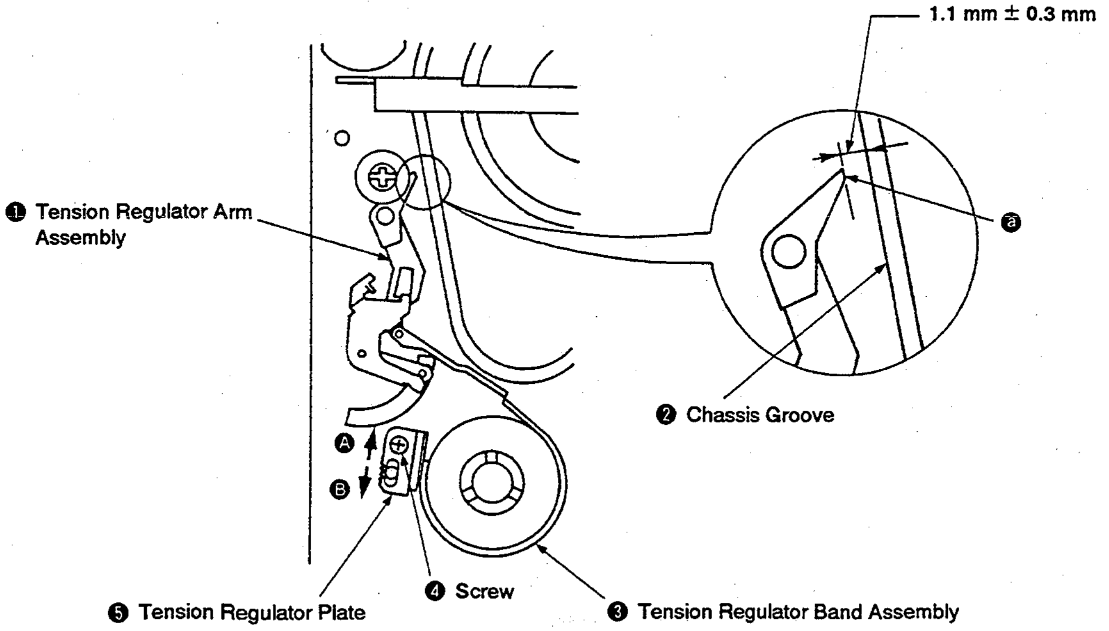

1.1 mm ± 0.3 mm
❶ Tension Regulator Arm Assembly
ⓐ
❷ Chassis Groove
Ⓐ
Ⓑ
❹ Screw
❺ Tension Regulator Plate
❸ Tension Regulator Band Assembly

Fig. 3-13.

3-13. DRUM ASSEMBLY, DEW SENSOR

1. Removal (See Fig. 3-14.)

1) Set the EJECT mode.
2) Remove the flexible board ❶ and the two connectors ❷.
3) Remove the guide guard assembly as described in section 3-2.
4) Remove the screw ❸, then remove the axle ground terminal ❹.
5) Remove the three screws ❺, then remove the drum assembly ❻ from the mechanism chassis.
6) Remove the connector ❿
7) Remove the screw ❼, then remove the dew sensor ❽.

Note:
- When removing the drum assembly ❻ from the mechanism chassis, take care not to cut the flexible board ❶ or the harness.
- Take care not to touch the head tip ❾.

2. Installation (See Fig. 3-14.)

1) Insert part 🅐 of the dew sensor ❽ into the notch ⓫ of the mechanism chassis, then secure it with the screw ❼.
2) Mount the connector ❿.
3) Clamp the harness ⓯ of the dew sensor ❽ with the reinforcing the claw ⓰ of the plate SS assembly (See Fig. A).
4) Insert the connector ❷ and the flexible board ❶ into the hole ⓬ of the mechanism chassis, align the drum assembly ❻ with the two dowels ⓭ and secure it with the three screws ❺.
5) Align the axle ground terminal ❷ with the two dowels ⓮ of the mechanism chassis and secure it with the screw ❸.
6) Mount the guide guard assembly as described in section 3-2.
7) Mount the two connectors ❷ and the flexible board ❶.

Note:
- Take care not to cut the flexible board ❶ or the harness ⓯.
- Take care not to touch the head tip ❾.
- After assembling, be sure to perform Tape Path Adjustment following instructions in section 4.

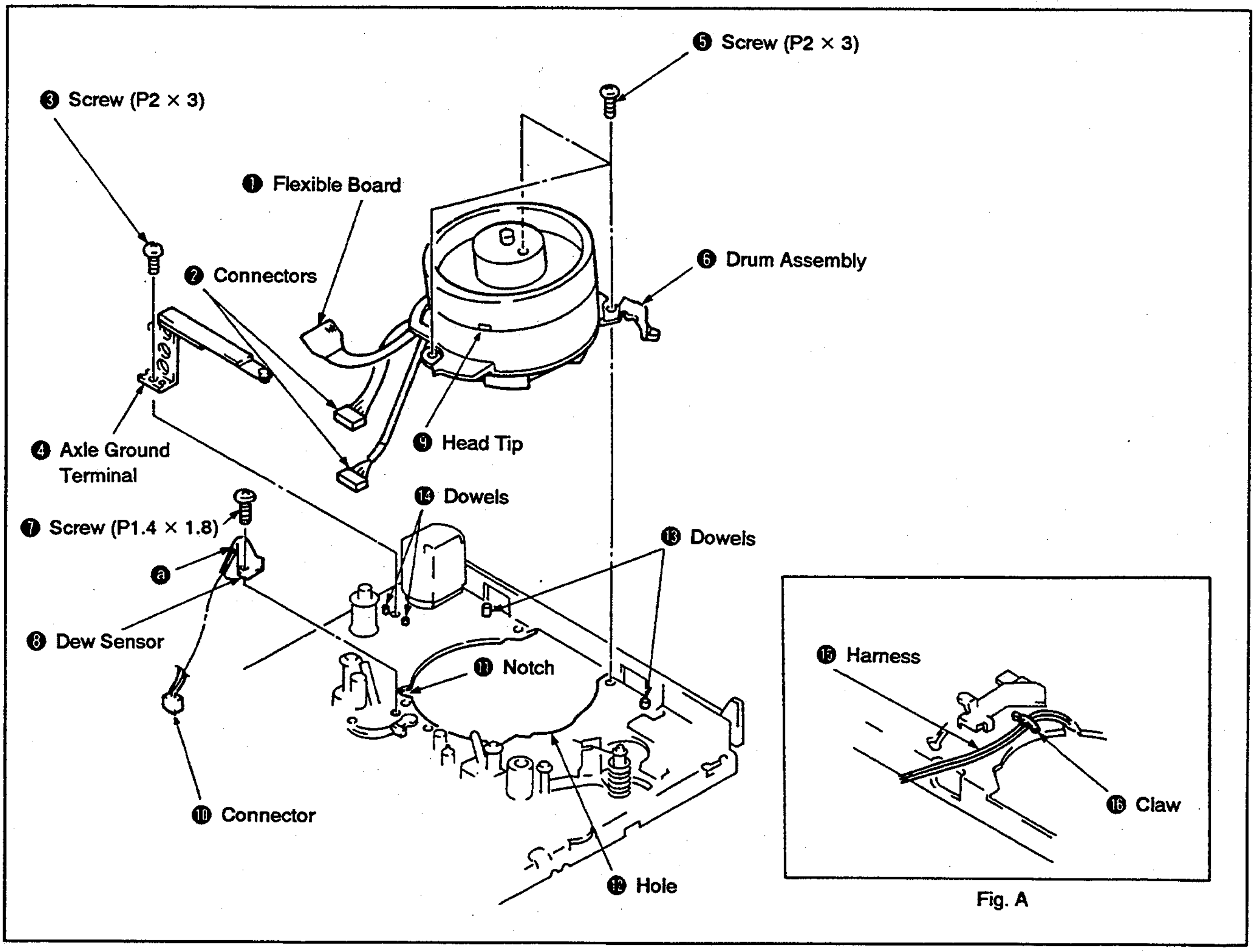

❺ Screw (P2 × 3)
❸ Screw (P2 × 3)
❶ Flexible Board
❻ Drum Assembly
❷ Connectors
❹ Axle Ground Terminal
❾ Head Tip
⓮ Dowels
❼ Screw (P1.4 × 1.8)
⓭ Dowels
🅐
❽ Dew Sensor
⓫ Notch
⓯ Harness
❿ Connector
⓰ Claw
⓬ Hole

Fig. A

Fig. 3-14.

3-14. EJECT LEVER, SWITCH LEVER ASSEMBLY, PINCH ROLLER SUB ARM ASSEMBLY

1. Removal (See Fig. 3-15.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Set the STOP mode.
3) Remove the claw ❶, then remove the eject lever ❷.
4) Remove the stopper washer ❸, then remove the switch lever assembly ❹.
5) Remove the pinch roller load spring ❺.
6) Remove the stopper washer ❻, then remove the pinch roller sub arm assembly ❼.

2. Installation (See Fig. 3-15.)

1) Grease the axle ❽ (See Fig. A).
2) Assemble by inserting ⓐ part of the pinch roller sub arm assembly ❼ into the slot ❾, then insert the pin ❿ into the loading lever assembly notch ⓫.
3) Secure with the stopper washer ❻.
4) Mount the pinch roller load spring ❺ by catching its ⓑ end between the claw ⓬ and the chassis side and its ⓒ end to the claw ⓬.
5) Apply half a drop of oil to the axle ⓭ (See Fig. B).
6) Align the groove ⓮ of the switch lever assembly ❹ with the mode detector switch protrusion ⓯, mount it on the axle ⓭, then insert the pin ⓰ into the drive gear (left) assembly ⓱ outer groove.
7) Secure with the stopper washer ❸.
8) Mount the eject lever ❷ and close the claw ❶.
9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the switch lever assembly ❹ onto the axle ⓭ with the tension regulator arm assembly installed, set the pin ⓲ to the arrow Ⓐ side of the switch lever assembly ❹.

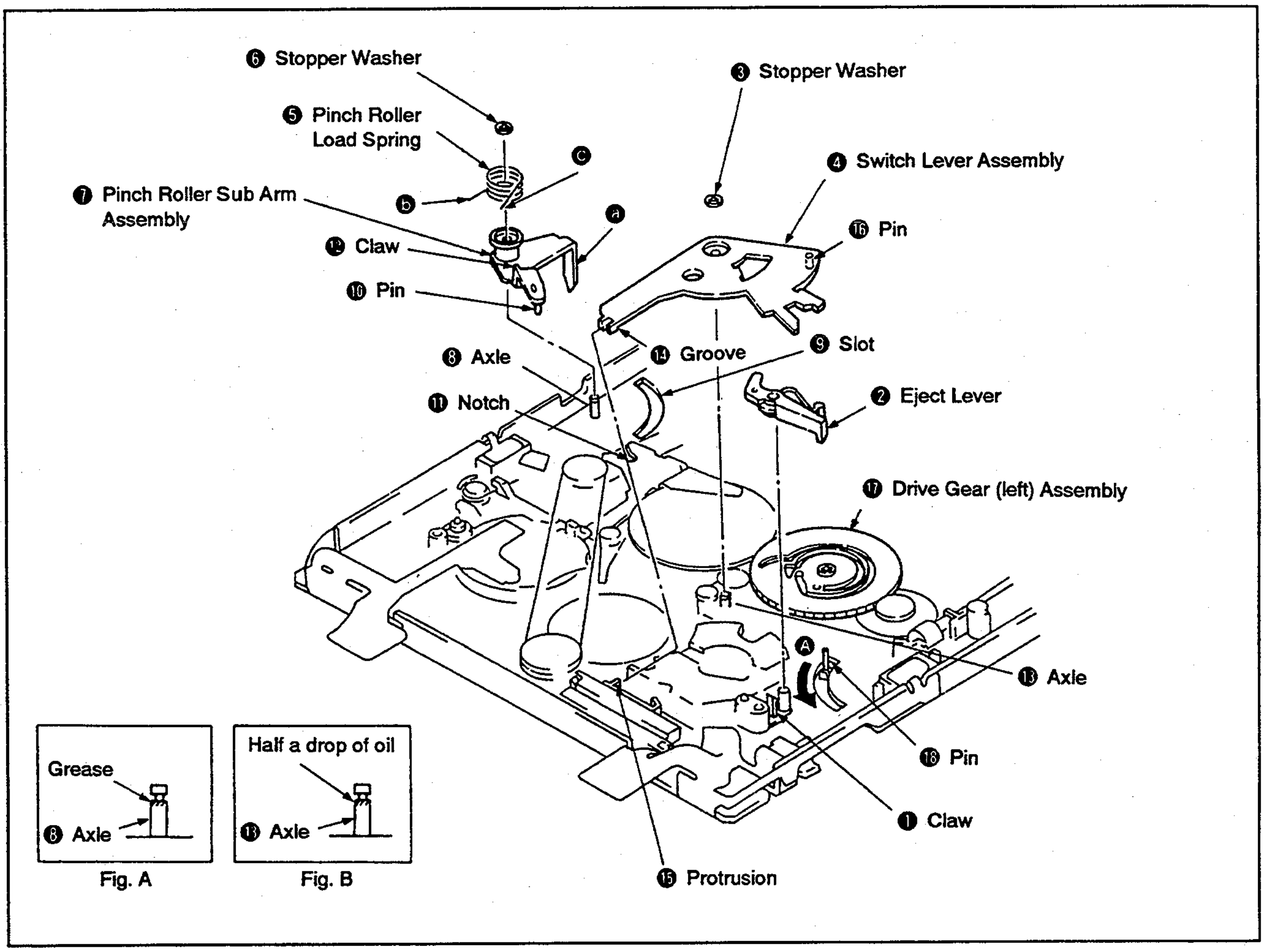

❻ Stopper Washer
❺ Pinch Roller Load Spring
ⓒ
❼ Pinch Roller Sub Arm Assembly
ⓑ
ⓐ
⓬ Claw
❿ Pin
❽ Axle
⓫ Notch
❸ Stopper Washer
❹ Switch Lever Assembly
⓰ Pin
⓮ Groove
❾ Slot
❷ Eject Lever
⓱ Drive Gear (left) Assembly
Ⓐ
⓭ Axle
⓲ Pin
❶ Claw
⓯ Protrusion
Grease
❽ Axle
Half a drop of oil
⓭ Axle

Fig. A

Fig. B

Fig. 3-15.

3-15. TIMING BELT (L) , RC GEAR ASSEMBLY, LOADING LEVER ASSEMBLY, TIMING BELT (S), CONNECTING GEAR ASSEMBLY

1. Removal (See Fig. 3-16.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the pinch roller sub arm assembly as described in section 3-14.
3) Set the STOP mode.
4) Remove the stopper washer ❶ , then remove the RC gear assembly ❷ from the axle ❹ with the timing belt (L) ❸ attached.
5) Remove the timing belt (L) ❸ from the idler pulley assembly ❺.
6) Remove the stopper washer ❻ and remove the loading lever assembly ❽ while pushing the claw ❼ in the direction of the arrow Ⓐ.
7) Turn the stopper ❾ approx. 90 ° in the direction of the arrow Ⓑ.
8) Remove the connecting gear assembly ⓫ from the axle ⓰ with the timing belt (S) ❿ attached.
9) Remove the timing belt (S) ❿ from the idler pulley assembly ❺.

Note: When removing the connecting gear ⓫ , take care not touch the flange section ⓑ.

2. Installation (See Fig. 3-16.)

1) Apply half a drop of oil to the axle ⓰ (See Fig. F).
2) Hook one end of the timing belt (S) ❿ onto the connecting gear assembly ⓫ and the other end onto gear ⓓ of the idler pulley assembly ❺. (Refer to the figure.)
3) Mount the connecting gear assembly ⓫ with the timing belt (S) ❿ attached to the axle ⓰.
4) Turn the stopper ❾ in the direction of the arrow Ⓒ as far as it will go.
5) Apply half a drop of oil to the axle ⓬ (See Fig. A).
6) Fit the loading lever assembly ❽ to the axle ⓬, secure the ⓐ part with the claw ❼ and place the pin ⓭ into the groove of the drive gear (right) assembly ⓮.
7) Install the stopper washer ❻.
8) Place the timing belt (L) ❸ around the gears of the RC gear assembly ❷ indicated in Fig. B, and its opposite side around the gear ⓒ of the idler pulley assembly ❺. (See Fig. E.)
9) Mount the RC gear assembly ❷ onto the axle ❹ with the timing belt (L) ❸ attached, and engage it with the gear of the RK gear assembly ⓯.
10) Install the stopper washer ❶.
11) Grease parts of the loading lever assembly ❽ indicated in Fig. C.
12) Mount the pinch roller sub arm assembly as described in section 3-14.
13) Mount the DC motor (capstan motor) as described in section 3-3.

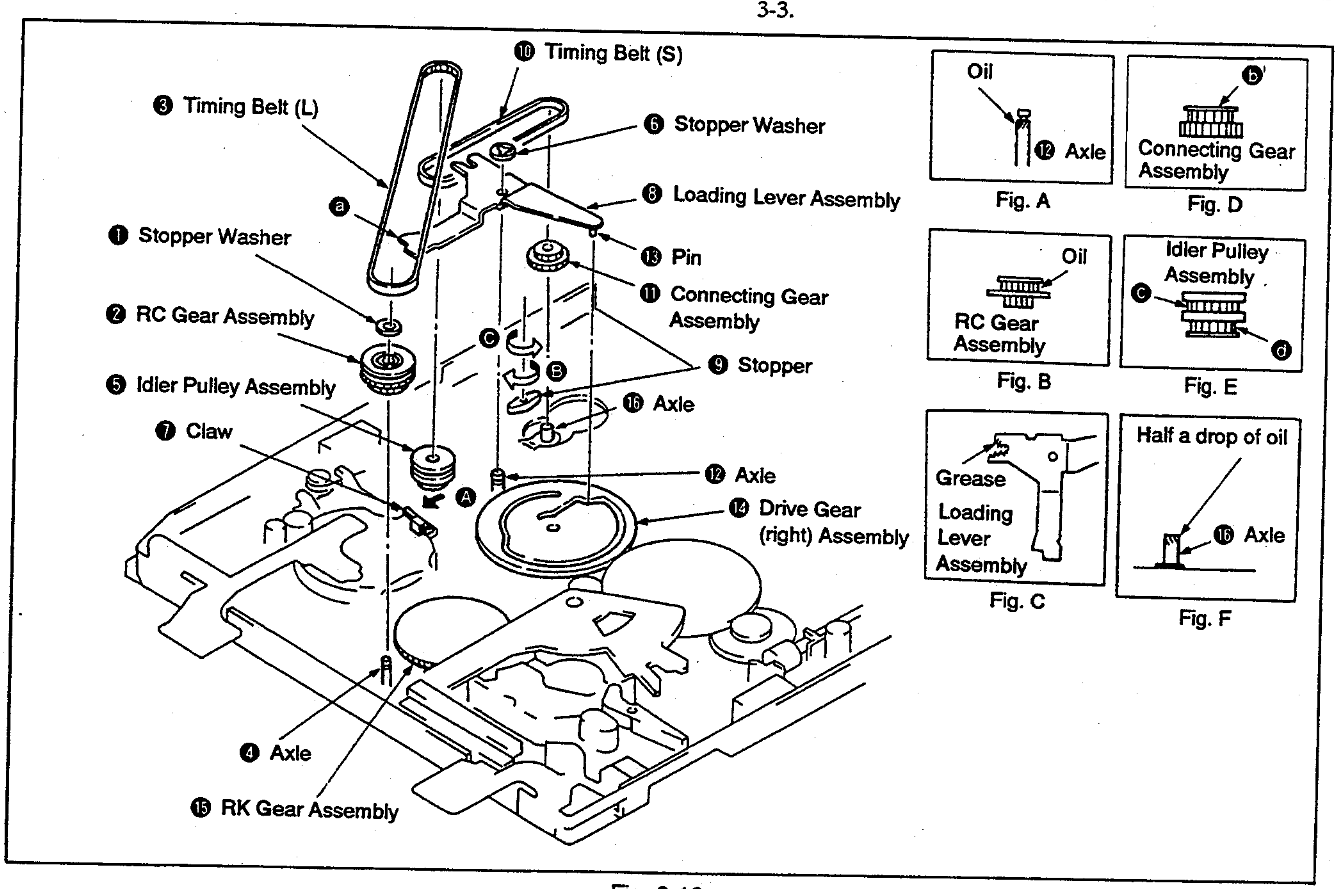

❿ Timing Belt (S)
❸ Timing Belt (L)
❻ Stopper Washer
❽ Loading Lever Assembly
ⓐ
❶ Stopper Washer
⓭ Pin
⓫ Connecting Gear Assembly
❷ RC Gear Assembly
Ⓒ
Ⓑ
❾ Stopper
❺ Idler Pulley Assembly
⓰ Axle
❼ Claw
Ⓐ
⓬ Axle
⓮ Drive Gear (right) Assembly
❹ Axle
⓯ RK Gear Assembly
Oil
⓬ Axle
ⓑ'
Connecting Gear Assembly
Oil
RC Gear Assembly
Idler Pulley Assembly
ⓒ
ⓓ
Grease
Loading Lever Assembly
Half a drop of oil
⓰ Axle

Fig. A Fig. D Fig. B Fig. E Fig. C Fig. F

Fig. 3-16.

3-16. IDLER PULLEY, TS BRAKE ASSEMBLY, LB GEAR ASSEMBLY, RK GEAR ASSEMBLY

1. Removal (See Fig. 3-17.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly described in section 3-15.
4) Set the STOP mode.
5) Remove the stopper washer ❶, then remove the idler pulley ❷.
6) Open the claw ❸, then remove the TS brake assembly ❹.
7) Remove the torsion coil spring (LB) ❺.
8) Remove the stopper washer ❻, then remove the LB gear assembly ❼.
9) Remove the RK gear assembly ❽.

Note: When removing the idler pulley ❷, take care not to touch the flange section ⓐ. (See Fig. C.)

2. Installation (See Fig. 3-17.)

1) Apply half a drop of oil to the axle ❾ (See Fig. A).
2) Mount the RK gear assembly ❽ onto the axle ❾, keeping it in horizontal position.
3) Apply half a drop of oil to the axle ❿ (See Fig. B).
4) Mount the LB gear assembly ❼ onto the axle ❿ and secure it with the stopper washer ❻.
5) Insert the torsion coil spring (LB) ❺ into the axle ⓫, then hook it to the mechanism chassis notch ⓬ and to the tab ⓭.
6) Mount the TS brake assembly ❹ and close the claw ❸.
7) Apply half a drop of oil to the axle ⓰ (See Fig. D).
8) Mount the idler pulley ❷ onto the axle ⓰, then secure it with the stopper washer ❶.
9) Mount the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly as described in section 3-15.
10) Mount the switch lever assembly as described in section 3-14.
11) Mount the DC motor (capstan motor) as described in section 3-3.

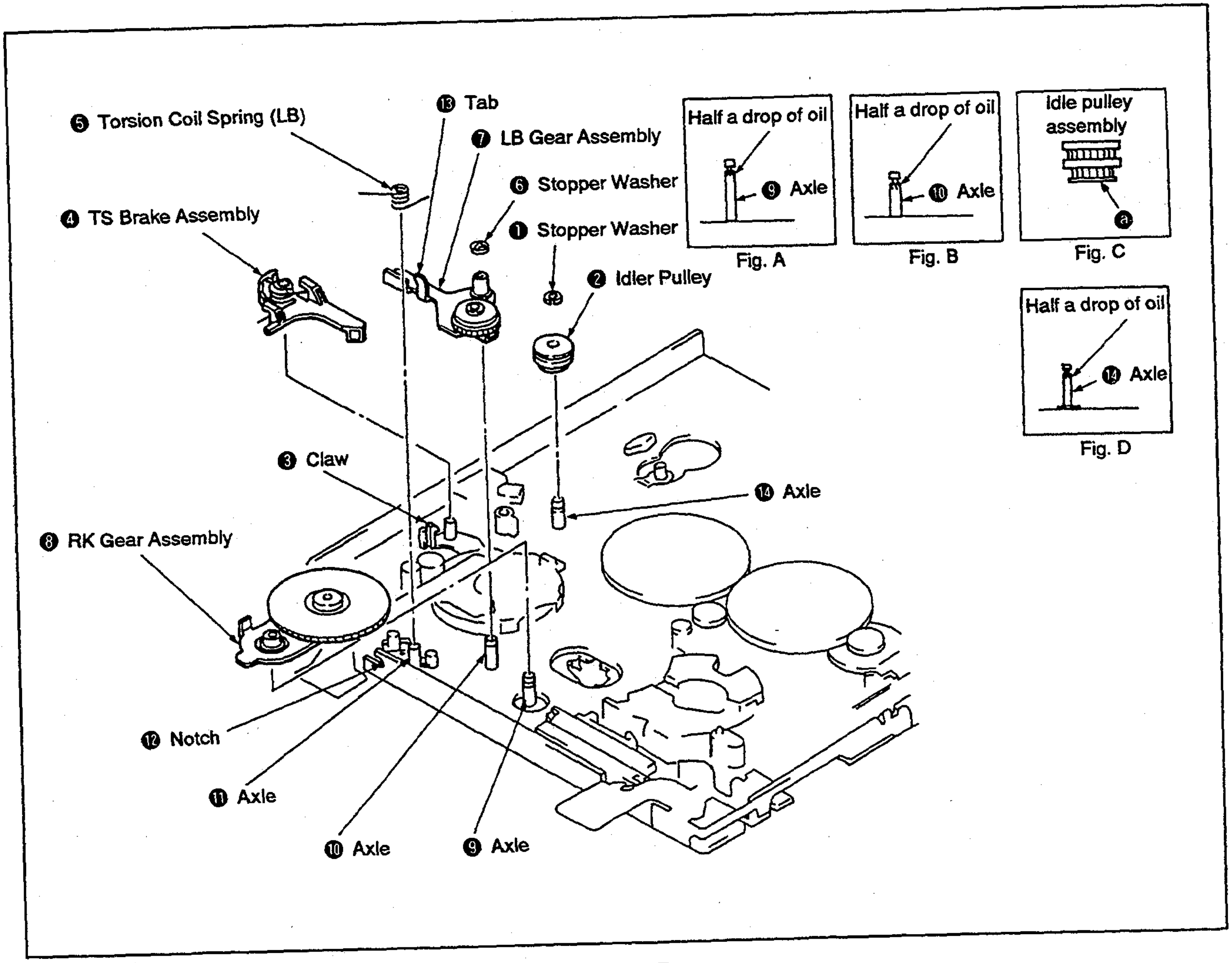

❺ Torsion Coil Spring (LB)
⓭ Tab
❼ LB Gear Assembly
❻ Stopper Washer
❶ Stopper Washer
❷ Idler Pulley
❹ TS Brake Assembly
Half a drop of oil
❾ Axle
Half a drop of oil
❿ Axle
Idle pulley assembly
ⓐ
Half a drop of oil
⓮ Axle
❸ Claw
⓮ Axle
❽ RK Gear Assembly
⓬ Notch
⓫ Axle
❿ Axle
❾ Axle
Fig. A
Fig. B
Fig. C
Fig. D

Fig. 3-17.

3-17. UL GEAR, UL BRAKE, UL ARM, LB PLATE SPRING

1. Removal (See Fig. 3-18.)

1) Remove the switch lever assembly as described in section 3-14.
2) Remove the stopper washer ❶, then remove the UL gear ❷.
3) Remove the UL arm ❸, the 1.6 mm-diameter poly washer ❹ and the LB plate spring ❺.
4) Remove the UL brake ❻.

2. Installation (See Fig. 3-18.)

1) Mount the UL brake ❻.
2) Apply half a drop of oil to the axle ❼ (See Fig. A).
3) Mount the LB plate spring ❺ to the axle ❼ as shown in Fig. B, then install the 1.6mm-diameter poly washer ❹.
4) Mount the UL arm ❸ to the axle ❼ so that the protrusion ❽ comes into the groove ❾ of the UL brake ❻.
5) Mount the UL gear ❷ to the axle ❼ and engage it with the gear of the drive gear (left) assembly ❿.
6) Install the stopper washer ❶.
7) Mount the switch lever assembly as described in section 3-14.

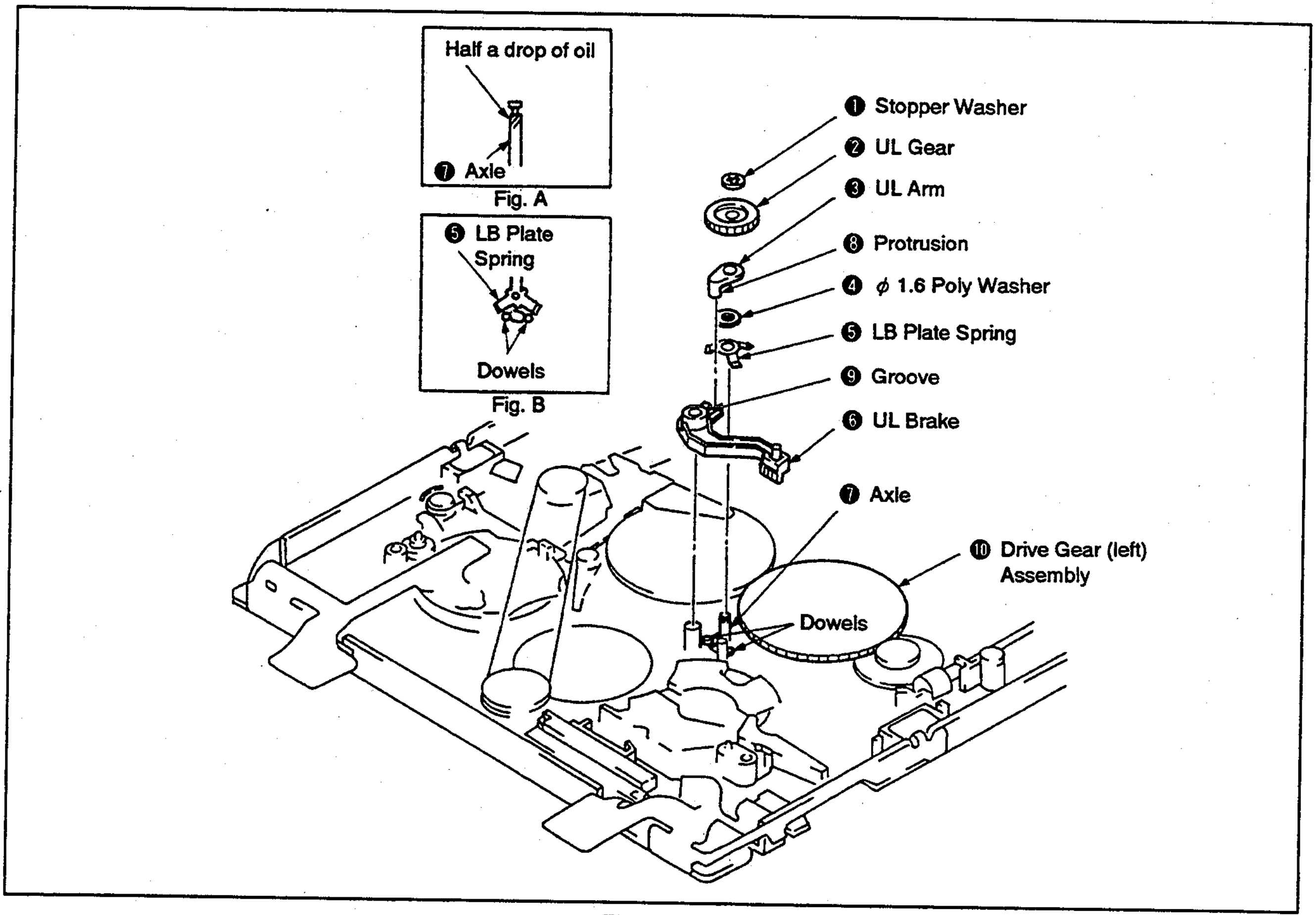

Half a drop of oil
❼ Axle
Fig. A
❺ LB Plate Spring
Dowels
Fig. B
❶ Stopper Washer
❷ UL Gear
❸ UL Arm
❽ Protrusion
❹ ϕ 1.6 Poly Washer
❺ LB Plate Spring
❾ Groove
❻ UL Brake
❼ Axle
❿ Drive Gear (left) Assembly
Dowels

Fig. 3-18.

3-18. COASTER (RIGHT) ASSEMBLY, DRIVE GEAR (RIGHT) ASSEMBLY

1. Removal (See Fig. 3-19.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum unit as described in section 3-13.
3) Remove the switch lever assembly as described in section 3-14.
4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Set the STOP mode.
6) Remove the screw ①, then remove the coaster plate spring ② and the coaster (right) assembly ③.
7) Remove the two screws ④, then remove the reinforcing plate TT ⑤.
8) Remove the stopper washer 1.5 ⑥, then remove the drive gear (right) assembly ⑦.

2. Installation (See Fig. 3-19.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ⑧ (See Fig. F).
3) Grease pin ⑨, axle ⑩ and dowel ⑭ of the coaster (right) assembly ③ (See Fig. D).
4) Mount by aligning the pin ⑨ and the axle ⑩ with the slot ⑪ of the mechanism chassis.
5) Move the brake release arm ⑫ in the direction of the arrow Ⓐ to put it out of the way.
6) Mount the drive gear (right) assembly ⑦ to the axle ⑧, and engage it with the drive gear (left) assembly ⑬ as shown in Fig. B.
7) Align the ⓐ part with the ⓑ part, and the hole ⑭ with the pin ⑨ of the coaster (right) assembly ③.
8) Install the stopper washer 1.5 ⑥.
9) Mount by aligning the coaster plate spring ② with the axle ⑩ of the coaster (right) assembly ③ and pin ⑨, then secure with the screw ①.
10) Mount the reinforcing plate TT ⑤ aligning it with the dowel ⑮, then tighten the two screws ④ in the indicated order.
11) Grease the points indicated in Figs. C and E.
12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly as described in section 3-14.
14) Mount the drum unit as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ① should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ③ and the coaster plate spring ② will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

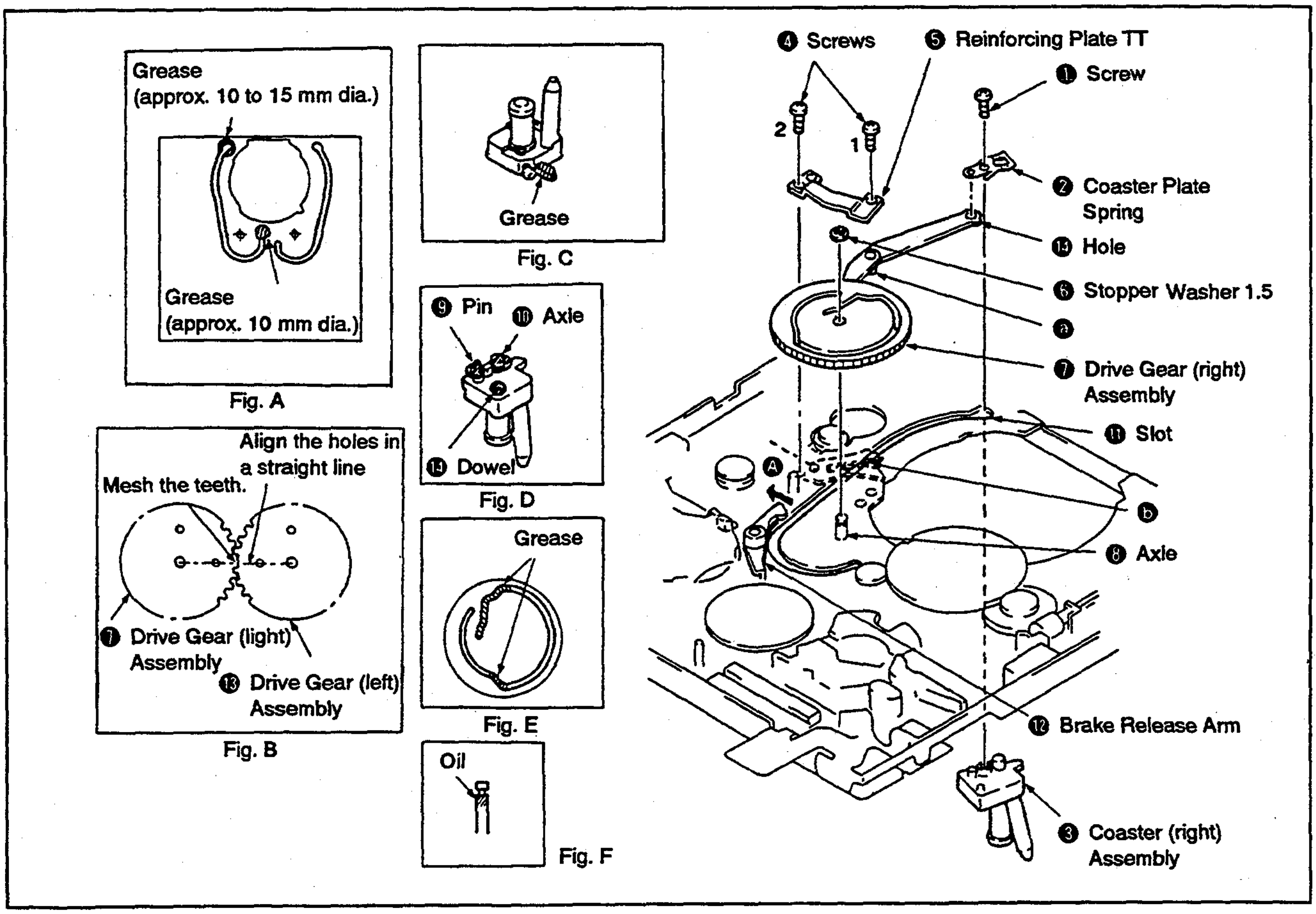

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
Align the holes in a straight line
Mesh the teeth.
⑦ Drive Gear (light) Assembly
⑬ Drive Gear (left) Assembly
Fig. B
Grease
Fig. C
⑨ Pin
⑩ Axle
⑮ Dowel
Fig. D
Grease
Fig. E
Oil
Fig. F
④ Screws
⑤ Reinforcing Plate TT
① Screw
2
1
② Coaster Plate Spring
⑭ Hole
⑥ Stopper Washer 1.5
ⓐ
⑦ Drive Gear (right) Assembly
⑪ Slot
Ⓐ
ⓑ
⑧ Axle
⑫ Brake Release Arm
③ Coaster (right) Assembly

Fig. 3-19.

3-19. COASTER (LEFT) ASSEMBLY, DRIVE GEAR (LEFT) ASSEMBLY

1. Removal (See Fig. 3-20.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum assembly as described in section 3-13.
3) Remove the switch lever assembly and the pinch roller sub-arm assembly as described in section 3-14.
4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Remove the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
6) Remove the screw ❶, then remove the coaster plate spring ❷ and the coaster (left) assembly ❸.
7) Remove the two screws ❹, then remove the reinforcing plate SS assembly ❺.
8) Remove the stopper washer 1.5 ❻, then remove the drive gear (left) assembly ❼.

2. Installation (See Fig. 3-20.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. E).
3) Grease pin ❾, axle ❿ and dowel ⓰ of the coaster (left) assembly ❸ (See Fig. B).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Fit the drive gear (left) assembly ❼ to the axle ❽, and mount so that the gear engages with the wheel gear ⓬ and the UL gear ⓭.
6) Align the ⓐ part with the slot ⓫, and the hole ⓮ with the pin ❾ of the coaster (left) assembly ❸.
7) Install the stopper washer 1.5 ❻.
8) Mount by aligning the coaster plate spring ❷ with the axle ❿ and pin ❾ of the coaster (left) assembly ❸, then secure with the screw ❶.
9) Mount the reinforcing plate SS assembly ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
10) Grease points indicated in Figs. C and D.
11) Mount the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
14) Mount the drum assembly as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

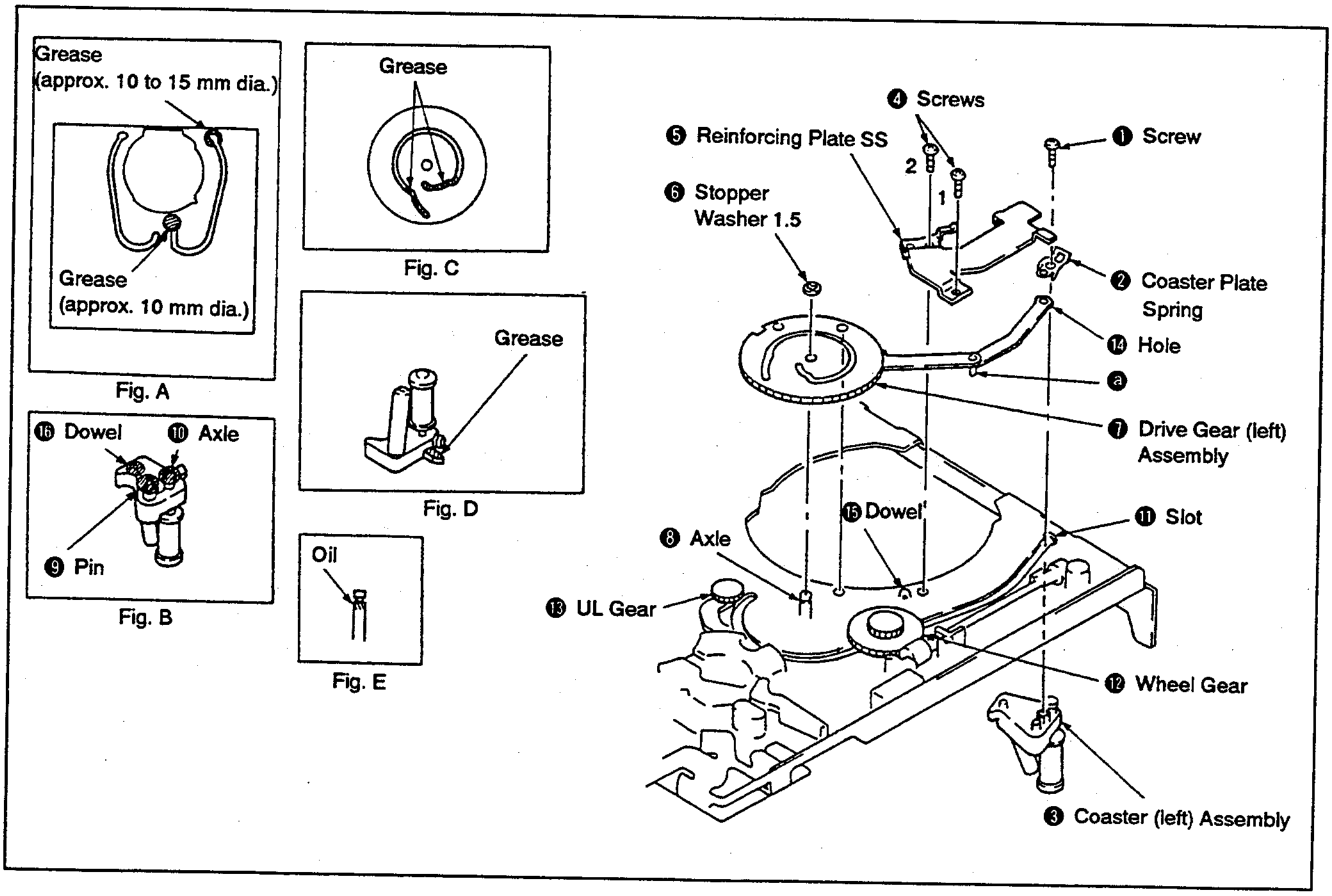

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
⓰ Dowel
❿ Axle
❾ Pin
Grease
Grease
Oil
❹ Screws
❺ Reinforcing Plate SS
2
1
❻ Stopper Washer 1.5
❶ Screw
❷ Coaster Plate Spring
⓮ Hole
ⓐ
❼ Drive Gear (left) Assembly
⓯ Dowel
❽ Axle
⓫ Slot
⓭ UL Gear
⓬ Wheel Gear
❸ Coaster (left) Assembly

Fig. A

Fig. B

Fig. C

Fig. D

Fig. E

Fig. 3-20.

3-20. LOADING MOTOR, BRAKE RELEASE ARM, WHEEL GEAR, WORM ASSEMBLY

1. Removal (See Fig. 3-21.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
4) Remove the drive gear (right) assembly as described in section 3-18.
5) Remove the drive gear (left) assembly as described in section 3-19.
6) Remove the two screws ❶, then remove the loading motor assembly ❷.
7) Remove the brake release arm ❸.
8) Remove the stopper washer ❹, then remove the wheel gear ❺.
9) Remove the worm assembly ❻ from the six claws ❼.

2. Installation (See Fig. 3-21.)

1) Mount the worm assembly ❻, matching it to the six claws ❼.
2) Grease the shaded parts of the worm assembly ❻ (five places) (see Fig A).
3) Apply half a drop of oil to the axle ❽ (See Fig. B).
4) Fit the wheel gear ❺ to the axle ❽ and engage it with the gear of the worm assembly ❻.
5) Mount the brake release arm ❸.
6) Grease the whole perimeter of the gear of the loading motor assembly ❷.
7) Align the loading motor assembly ❷ with the mechanism chassis and secure it with the two screws ❷.
8) Mount the drive gear (left) assembly as described in section 3-19.
9) Mount the drive gear (right) assembly as described in section 3-18.
10) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
11) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
12) Mount the DC motor (capstan motor) as described in section 3-3.

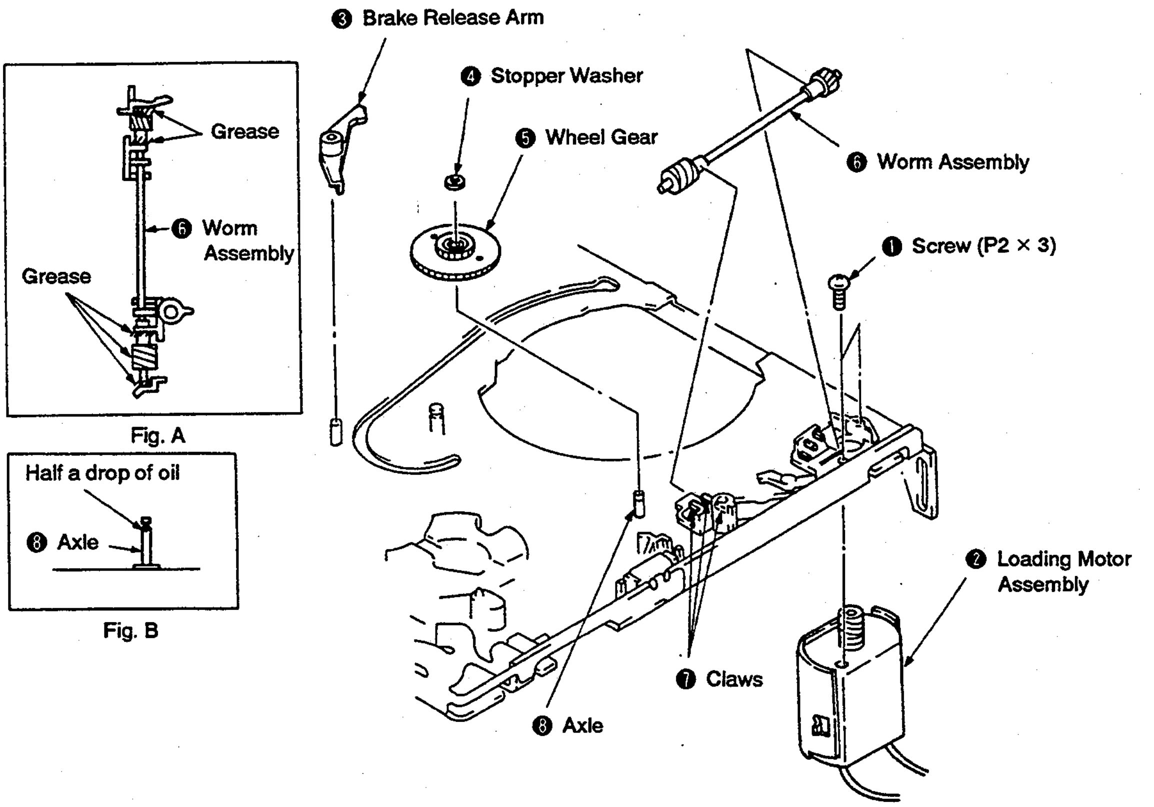


Fig. A

Fig. B

Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.

1) Detach the six solderings ⓐ, then use a pair of tweezers or the like to confirm that the terminals passing through the board holes from below can move freely.
2) Remove the two screws ❶ (See Fig. 3-22).
3) Mount the jig ❹ (Ref. No. J-7) with the two supplied screws ❷, then screw the attached hexagon socket screws ❸ to the jig ❹. The rotary upper drum ❺ will move upward and come off (See Fig. 3-23).

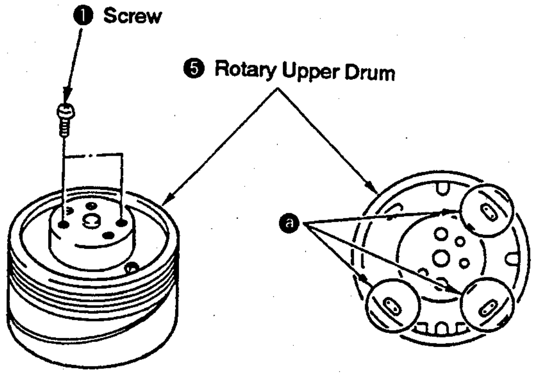


Fig. 3-22.

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ❺ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ❼ (Ref. No. J-7) into the drum positioning hole, then set the rotary upper drum ❺ by passing the jig through its positioning hole ❻.
   Note: Confirm that the terminals ❽ protrude slightly from the rotary upper drum board holes (See Fig. 3-24).
3) Remove the jig ❼ and push down the rotary upper drum ❺ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ❶ alternately.
4) Insert the jig ❼ into the positioning hole ❻ again and confirm that it goes in smoothly. If it does not, loosen the two screws ❶, repeat step 3 of the Removal paragraph and restart the setting procedure.
5) Tighten the screws ❶.
6) Solder the terminals ❽ (ⓐ in Fig. 3-22).
   Note: Take care that no solder flows below the board.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

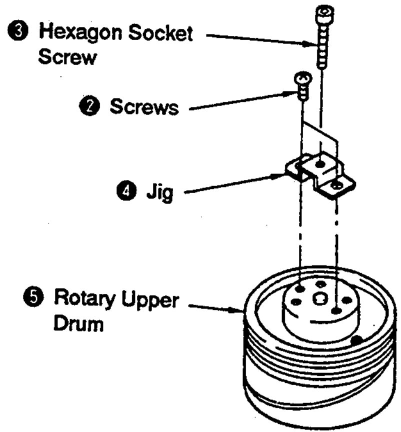


Fig. 3-23.

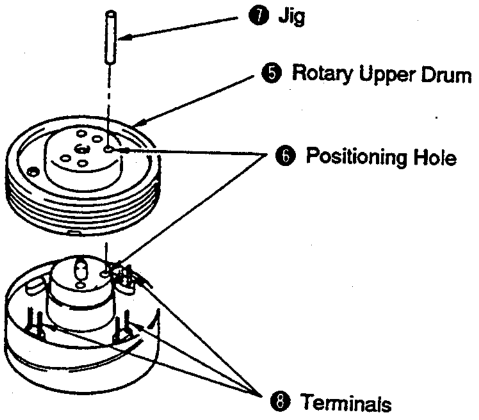


Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25.)

1) Set the torque cassette (Ref. No. J-6).
2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g•cm.
3) If the torque value does not meet the specification, adjust the adjust arm ❶.

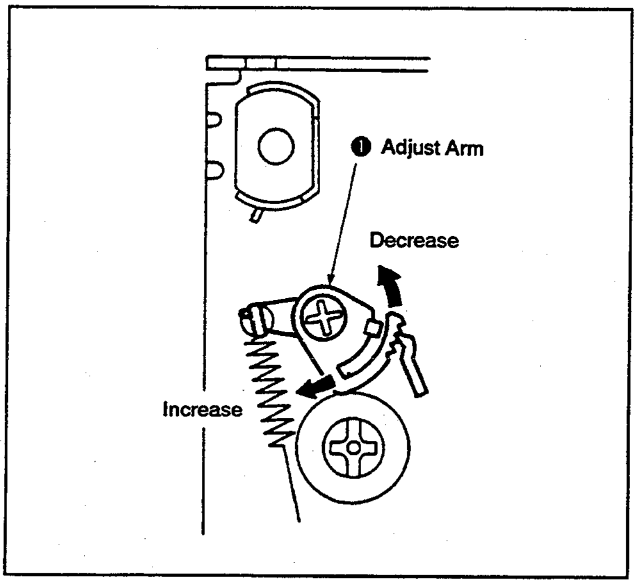


Fig. 3-25.

3-23. REEL TORQUE CHECK

1) Set the torque cassette.
2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g•cm.
3) Set the REV mode and confirm that S reel table torque value is within 29 ± 6 g•cm.
4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g•cm.
5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

[The Track Shift Mode]

In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.

On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible.

This can be solved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/4) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING

[Setting Procedure]

- Connect the TEST A and TEST B terminals to the COM terminal.

  Example:

  NTSC ········ GV-8
  PAL ·········· GV-8E

  Connect Pins ① and pin ③ of CN017 on the { SV-34 board (GV-8) / SV-35 board (GV-8E) } to pin ② of it. (See Fig. 4-1)

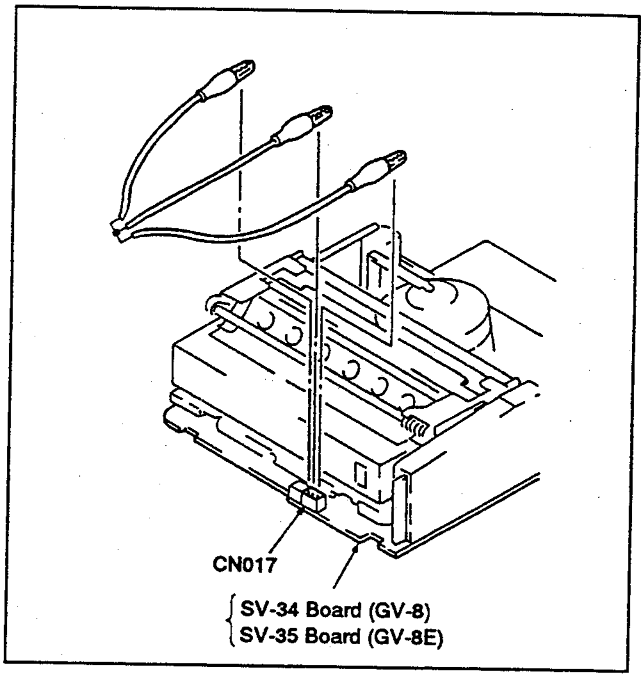
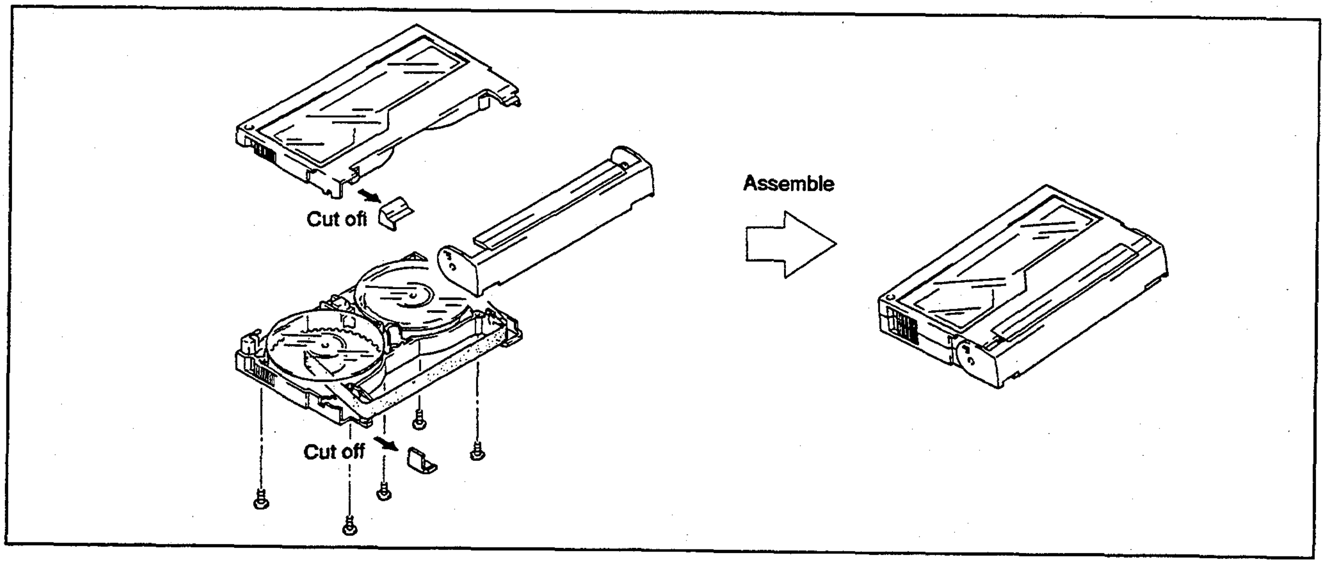


Fig. 4-1.

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2). Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-5), modified as follows, and perform adjustment in playback mode.


Cut off
Cut off
Assemble

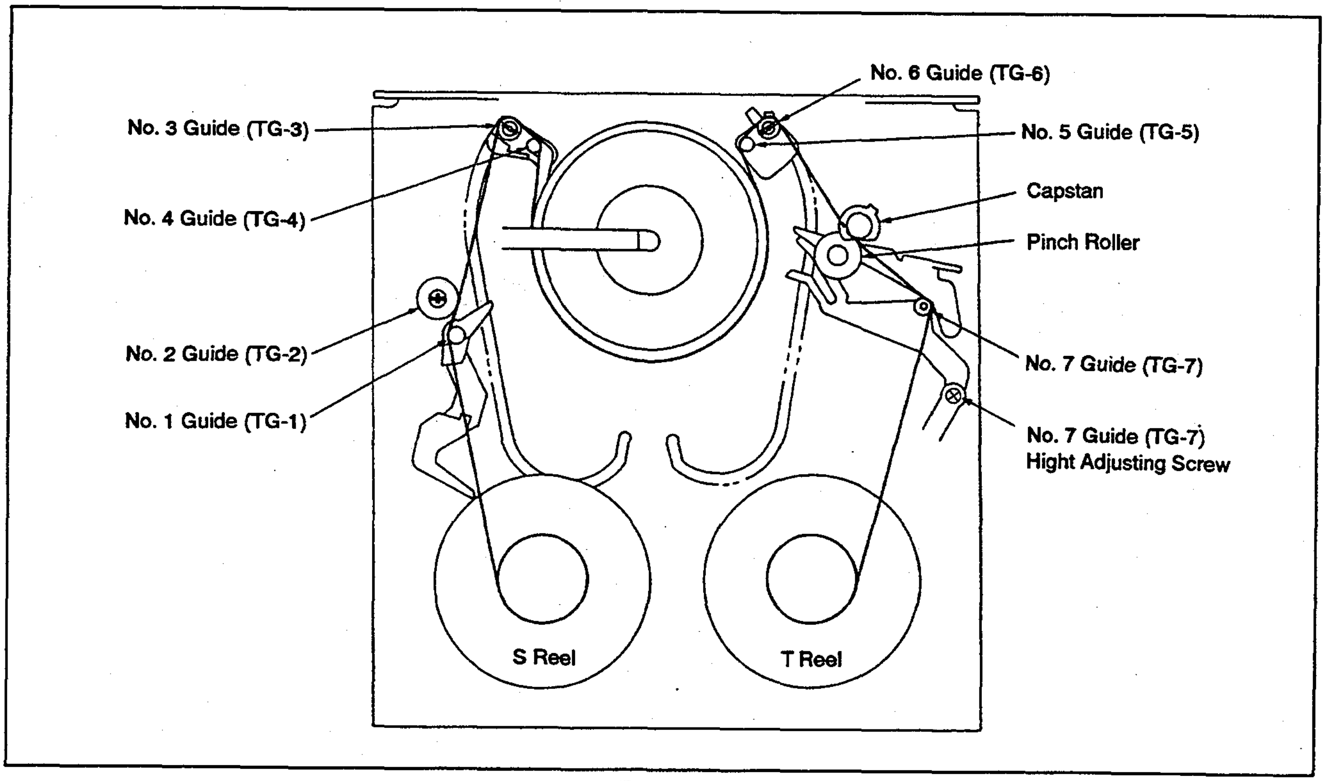

No. 6 Guide (TG-6)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
Capstan
No. 4 Guide (TG-4)
Pinch Roller
No. 2 Guide (TG-2)
No. 7 Guide (TG-7)
No. 1 Guide (TG-1)
No. 7 Guide (TG-7)
Hight Adjusting Screw
S Reel
T Reel

Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
2) Connection of oscilloscope and output method of waveform.
   CH 1: RF signal output of the drum head (V RF OUT)
   Method for signal output:
   Short-circuit the external trigger output (RF SW. P) and GND.

   Example:
   NTSC ····· GV-8
   PAL ······· GV-8E
   CH 1: Pin ③ (V RF OUT) of CN018 on the
   { SV-34 board (GV-8)
   { SV-35 board (GV-8E)
   Method for signal output:
   Short-circuit pin ① (GND) and pin ② (RF SW.P) of CN018 on the
   { SV-34 board (GV-8)
   { SV-35 board (GV-8E)
3) Play back the alignment tape for tracking adjustment (Ref. No. J-5).
4) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-4). If they are not, adjust as follows.

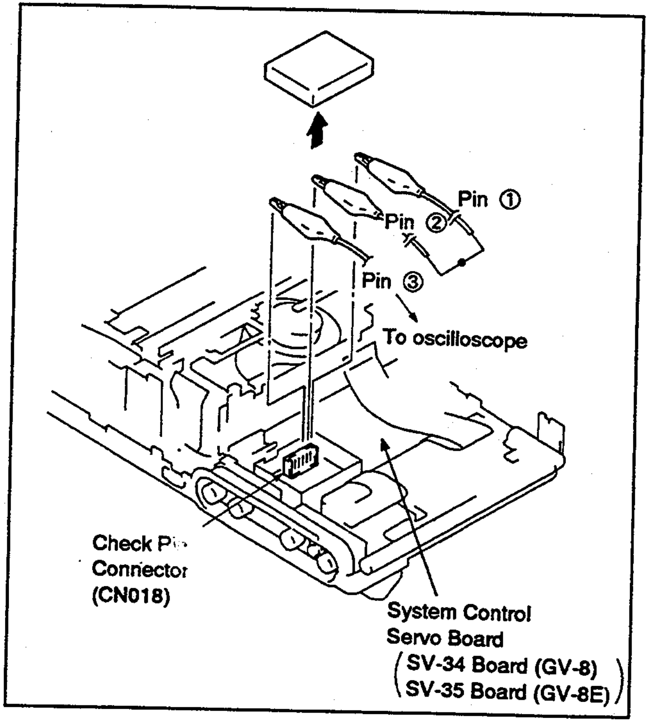

Pin ①
Pin ②
Pin ③
To oscilloscope
Check Pin Connector (CN018)
System Control Servo Board
(SV-34 Board (GV-8)
SV-35 Board (GV-8E))

Fig. 4-3.

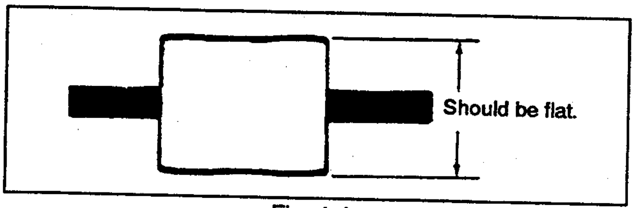

Should be flat.

Fig. 4-4.

4-3. TRACKING ADJUSTMENT (See Fig. 4-5.)

1) Play back the alignment tape for tracking adjustment.
2) Pass a hexagonal wrench, screwdriver (Ref. No. J-11) or the like through the hole ❶, loosen the lockscrew ❷ a little, then make the entrance side waveform flat by turning the No. 3 guide (TG-3) ❸.
3) Pass a hexagonal wrench, screwdriver or the like through the hole ❹, loosen the lockscrew ❺ a little, then make the exit side waveform flat by turning the No. 6 guide (TG-6) ❻.

Note: Take care not to loosen lockscrews too much, since guides come loose easily.

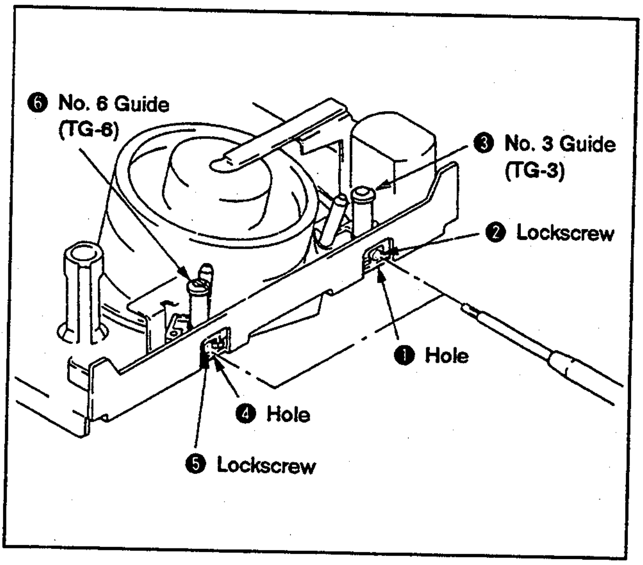

❻ No. 6 Guide (TG-6)
❸ No. 3 Guide (TG-3)
❷ Lockscrew
❶ Hole
❹ Hole
❺ Lockscrew

Fig. 4-5.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-5. and 4-6.)

1) Play back the alignment tape for tracking adjustment and set the track shift mode.
2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
3) Fix the No. 3 guide ❸ by tightening its lockscrew ❷. Then confirm that the entrance side waveform has not changed.
4) Fix the No. 6 guide ❻ by tightening its lockscrew ❺. Then confirm that the exit side waveform has not changed.

Note: The set screws ❷ and ❺ should be tightened with a tightening torgue of approx. 200g•cm ± 10%.
If tightened too much, there is danger of damaging the thread.

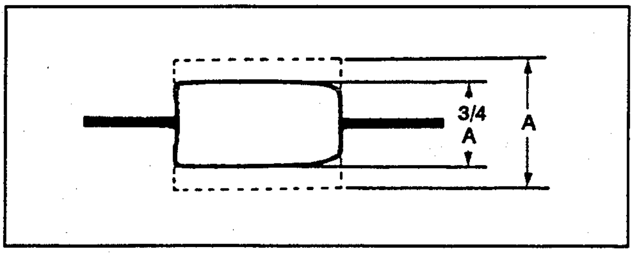


Fig. 4-6.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-7.)

1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by rotating the TG-2 upper flange ❶.

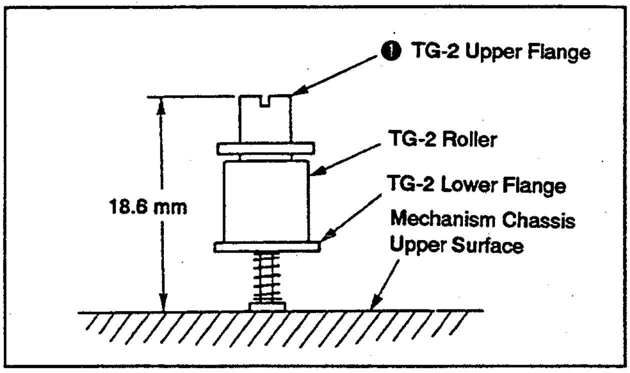


Fig. 4-7.

[Reference]
This U mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Counterclockwise
	Lower	Clockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-8. and 4-9.)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No. 2 guide (TG-2) ❶ (See Fig. 4-8). If it is, turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (See Fig. 4-9), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counter-clockwise and repeat step 5.
   Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

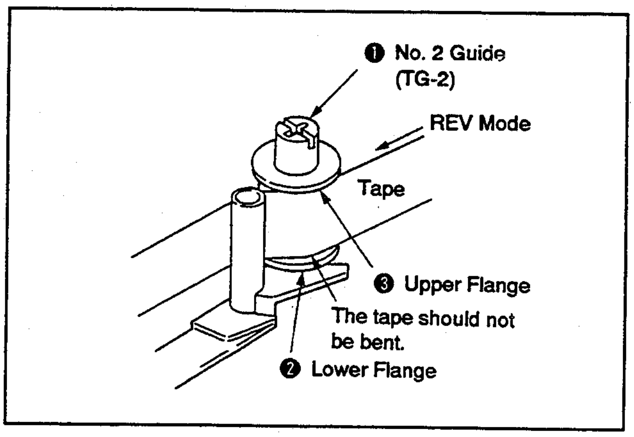

❶ No. 2 Guide (TG-2)
REV Mode
Tape
❸ Upper Flange
The tape should not be bent.
❷ Lower Flange

Fig. 4-8.

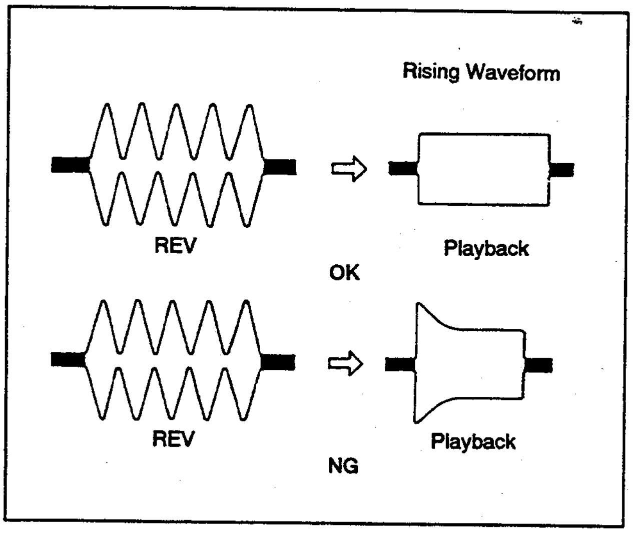

Rising Waveform
REV
Playback
OK
REV
Playback
NG

Fig. 4-9.

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

1) Play back the alignment tape for tracking adjustment and set the REV mode.
2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ❶ and the capstan ❷ . If it is, turn the hight adjusting screw ❹ of the No. 7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No. 7 guide (specification:0.5 mm or less) . If the tape is bent beyond the specification, turn the No. 7 guide (TG-7) ❸ until bending is within the specification (0.5 mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3 mm or less, adjustment can be considered completed.

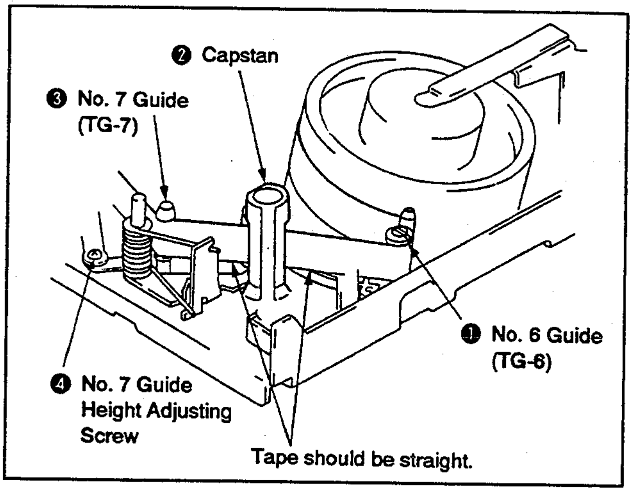

❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)
❹ No. 7 Guide Height Adjusting Screw
Tape should be straight.

Fig. 4-10.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-11.)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-11). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-11). Otherwise, perform section 4-4. Tracking Fine Adjustment.

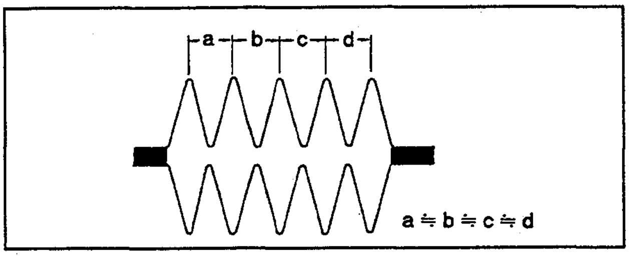


Fig. 4-11.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (See Fig. 4-12).
2) Then, confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (See Fig. 4-13).
3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-14).

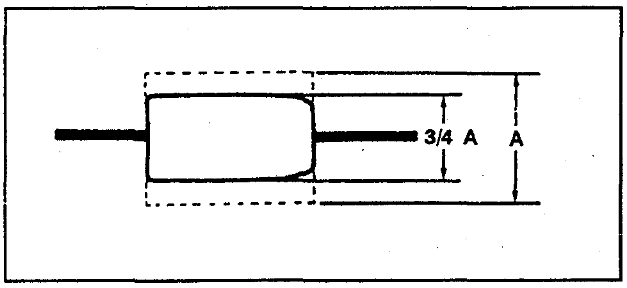


Fig. 4-12.

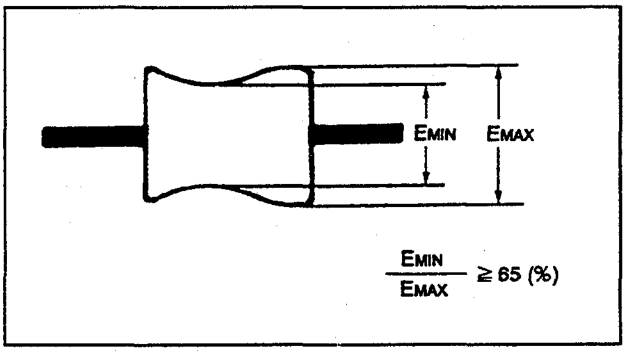


Fig. 4-13.

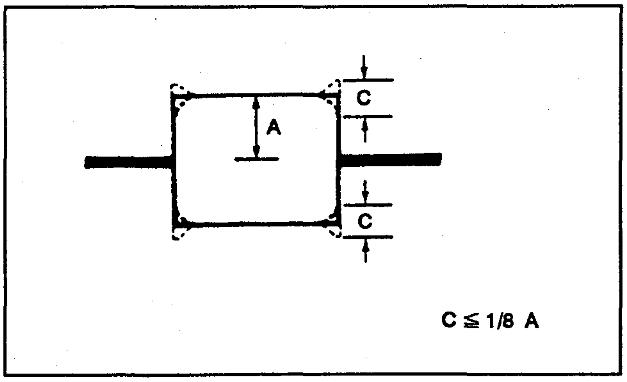


Fig. 4-14.

4-8-2. Rising Check (See Fig. 4-15.)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-15).
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

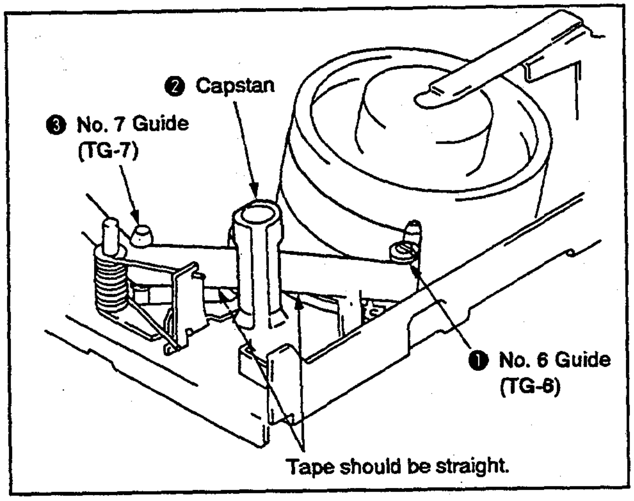

❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)
Tape should be straight.

Fig. 4-15.

4-8-3. Tape Path Check (See Fig. 4-16.)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

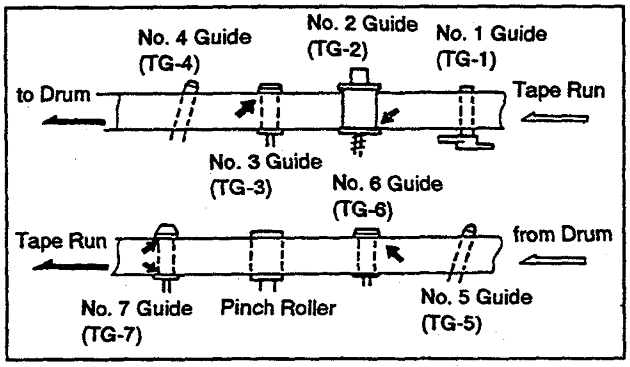

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 1 Guide (TG-1)
to Drum
Tape Run
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
Tape Run
from Drum
No. 7 Guide (TG-7)
Pinch Roller
No. 5 Guide (TG-5)

Fig. 4-16.